



**AMERICAN
SURGICAL
ASSOCIATION**

Program
of the
137th Annual Meeting

**Philadelphia Marriott Downtown
Philadelphia, Pennsylvania**

Thursday, April 20th Friday, April 21st
Saturday, April 22nd
2017

Table of Contents

| | |
|--|-----|
| Officers and Council | 2 |
| Committees | 3 |
| Foundation Trustees | 5 |
| Representatives | 6 |
| Future Meetings | 7 |
| General Information | 8 |
| Continuing Medical Education Accreditation Information | 10 |
| Program Committee Disclosure List | * |
| Invited Faculty Disclosure List | * |
| Author Disclosure List | * |
| Discussant Disclosure List | * |
| New Honorary Fellows | 17 |
| Schedule-at-a-Glance | 21 |
| Program Outline | 23 |
| Program Detail and Abstracts | 42 |
| Alphabetical Directory of Fellows | * |
| Geographic Roster of Fellows | * |
| Necrology | 314 |
| Medallion for Scientific Achievement Recipients | 315 |
| Medallion for Advancement of Surgical Care Recipients | 317 |
| Flance-Karl Award Recipients | 318 |
| Foundation Fellowship Award Recipients | 320 |
| Foundation Contributors | * |
| Author Index | 332 |
| Record of Attendance | * |
| Membership Update Form | * |

* These sections available on-site to professional attendees,
or by logging into americansurgical.info/membersOnly.cgi.

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**Philadelphia Marriott Downtown
Philadelphia, Pennsylvania**

Thursday, April 20th Friday, April 21st
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2017

THE AMERICAN SURGICAL ASSOCIATION**2016–2017****OFFICERS**

President

Keith D. Lillemoe

President-Elect

Ronald V. Maier

Vice President

Theodore N. Pappas

Secretary

Ronald J. Weigel

Treasurer

B. Mark Evers

Recorder

Jeffrey A. Drebin**COUNCIL**

| | |
|--------------------------|-----------|
| James S. Economou | 2016–2019 |
| Anna M. Ledgerwood | 2015–2018 |
| Layton F. Ridders | 2014–2017 |

American Surgical Association
 Administrative Offices
 500 Cummings Center, Suite 4400
 Beverly, MA 01915
 Phone: (978) 927-8330 Fax: (978) 524-0498
 Email: admin@americansurgical.org
 Or visit: americansurgical.org

ADVISORY MEMBERSHIP COMMITTEE

| | |
|--|-----------|
| William C. Chapman, <i>Chair</i> | 2016–2019 |
| Edward E. Cornwell, III | 2014–2019 |
| Diana L. Farmer | 2012–2017 |
| David R. Flum | 2014–2019 |
| O. Joe Hines | 2016–2021 |
| Kim M. Olthoff | 2016–2021 |
| H. Leon Pachter | 2013–2018 |
| Mitchell C. Posner | 2016–2021 |
| Kenneth W. Sharp | 2013–2018 |
| Craig R. Smith | 2012–2017 |
| David A. Spain | 2015–2020 |
| Mark A. Talamini | 2013–2018 |
| Douglas S. Tyler | 2015–2020 |
| Michael T. Watkins | 2013–2018 |
| Sharon M. Weber | 2014–2019 |

ARRANGEMENTS COMMITTEE

137th Annual Meeting
 Jeffrey A. Drebin, *Chair*

AUDIT COMMITTEE

| | |
|--------------------------------------|-----------|
| Karen E. Deveney, <i>Chair</i> | 2015–2017 |
| Daniel G. Coit | 2016–2018 |
| Taylor S. Raill | 2017–2019 |

ETHICS AND PROFESSIONALISM COMMITTEE

| | |
|--|-----------|
| Anna M. Ledgerwood, <i>Chair</i> | 2014–2017 |
| Peter Angelos | 2016–2019 |
| James S. Economou | 2014–2018 |
| Keith D. Lillemoe | 2015–2019 |
| Ronald V. Maier | 2016–2020 |
| George C. Velmahos | 2014–2017 |

HONORARY FELLOWSHIPS COMMITTEE

| | |
|---|-----------|
| Timothy J. Eberlein, <i>Chair</i> | 2017–2023 |
| E. Christopher Ellison..... | 2016–2022 |
| Carlos Fernandez-del Castillo..... | 2017–2023 |
| Yuman Fong | 2013–2019 |
| Keith D. Lillemoe | 2014–2020 |
| Fabrizio Michelassi..... | 2016–2022 |
| Marco G. Patti..... | 2015–2021 |

FLANCE-KARL AWARD COMMITTEE

| | |
|--------------------------------------|-----------|
| Ronald J. Weigel, <i>Chair</i> | 2012–2017 |
| Timothy R. Billiar..... | 2013–2018 |
| Jeffrey A. Drebin..... | 2014–2019 |
| Douglas B. Evans..... | 2015–2020 |
| Kelly K. Hunt..... | 2016–2021 |

**MEDALLION FOR THE ADVANCEMENT OF
SURGICAL CARE AWARD COMMITTEE**

| | |
|-------------------------------------|-----------|
| Ronald V. Maier, <i>Chair</i> | 2016–2019 |
| Kirby I. Bland | 2016–2017 |
| Jeffrey A. Drebin..... | 2016–2017 |
| James S. Economou | 2014–2017 |
| Keith D. Lillemoe | 2015–2018 |
| Ronald J. Weigel | 2012–2017 |

NOMINATING COMMITTEE

| | |
|---------------------------------------|-----------|
| Layton F. Rikkers, <i>Chair</i> | 2014–2019 |
| L.D. Britt..... | 2015–2018 |
| Timothy J. Eberlein..... | 2012–2017 |
| James S. Economou | 2016–2021 |
| Anna M. Ledgerwood | 2015–2020 |

PROGRAM COMMITTEE

| | |
|---------------------------------------|-----------|
| Jeffrey A. Drebin, <i>Chair</i> | 2012–2017 |
| Herbert Chen..... | 2014–2019 |
| Yolonda L. Colson | 2016–2022 |
| Lawrence N. Diebel | 2015–2020 |
| Nipun B. Merchant..... | 2016–2021 |
| Roger R. Perry | 2013–2018 |

President, President-Elect, Secretary, and Recorder, ex officio with vote

**TRUSTEES OF THE
AMERICAN SURGICAL ASSOCIATION
FOUNDATION****Chair**

Kirby I. Bland

Vice Chair

Timothy J. Eberlein

Secretary

Ronald J. Weigel

Treasurer

B. Mark Evers

Trustees

L.D. Britt

Anna M. Ledgerwood

Layton F. Rikkers

Ex-Officio

Keith D. Lillemoe

REPRESENTATIVES**AMERICAN BOARD OF SURGERY**

| | |
|-------------------------|-----------|
| Karen J. Brasel..... | 2012–2018 |
| William C. Chapman..... | 2013–2019 |
| Mary T. Hawn..... | 2015–2021 |
| K. Craig Kent..... | 2013–2019 |

AMERICAN BOARD OF THORACIC SURGERY

| | |
|------------------------|-----------|
| Robert S. Higgins..... | 2011–2017 |
| Michael J. Mack..... | 2015–2021 |

**AMERICAN COLLEGE OF SURGEONS,
BOARD OF GOVERNORS**

| | |
|------------------------|-----------|
| Russell J. Nauta..... | 2013–2019 |
| Bruce D. Schirmer..... | 2014–2017 |

**AMERICAN COLLEGE OF SURGEONS,
ADVISORY COUNCIL FOR GENERAL SURGERY**

| | |
|----------------------|-----------|
| Celia M. Divino..... | 2015–2018 |
|----------------------|-----------|

**AMERICAN COLLEGE OF SURGEONS,
SURGICAL RESEARCH COMMITTEE**

| | |
|--------------------------|-----------|
| Jeffrey B. Matthews..... | 2013–2019 |
|--------------------------|-----------|

**ASSOCIATION OF AMERICAN MEDICAL COLLEGES,
COUNCIL OF FACULTY AND ACADEMIC SOCIETIES**

| | |
|-----------------------|-----------|
| Susan Galandiuk..... | 2013–2019 |
| Ajit K. Sachdeva..... | 2013–2019 |

NATIONAL ASSOCIATION FOR BIOMEDICAL RESEARCH

| | |
|-------------------------|-----------|
| Carlos O. Esquivel..... | 2015–2017 |
|-------------------------|-----------|

SURGICAL COUNCIL ON RESIDENT EDUCATION

| | |
|--------------------|-----------|
| Jon B. Morris..... | 2015–2019 |
|--------------------|-----------|

**FUTURE MEETINGS OF THE
AMERICAN SURGICAL ASSOCIATION**

April 19–21, 2018
J.W. Marriott Hotel Phoenix Desert Ridge
Phoenix, Arizona

April 11–13, 2019
Fairmont Dallas
Dallas, Texas

April 16–18, 2020
Grand Hyatt Washington
Washington, DC

GENERAL INFORMATION

The Philadelphia Marriott Downtown, Pennsylvania, is the headquarters of the American Surgical Association for the 137th Annual Meeting, April 20–22, 2017.

REGISTRATION: The Registration Desk for the 137th Annual Meeting is located outside the Grand Ballroom Salon E during the following hours:

| | |
|-----------------------------------|----------------------|
| Wednesday, April 19 th | 2:00 p.m.–6:00 p.m. |
| Thursday, April 20 th | 7:00 a.m.–5:15 p.m. |
| Friday, April 21 st | 7:30 a.m.–5:00 p.m. |
| Saturday, April 22 nd | 7:30 a.m.–11:00 a.m. |

Fellows and guests who have pre-registered are required to sign the registration book and pick up registration materials at the ASA Registration Desk. Registration is also available on-site.

SPEAKERS AND DISCUSSANTS: All manuscripts presented at the Scientific Sessions of the Annual Meeting must be submitted electronically to The *Annals of Surgery* at www.editorialmanager.com/annsurg prior to the presentation of the paper. The time allowed for each presentation is ten minutes. Following the presentation, the Primary Discussant will be allotted three minutes for discussion. All additional discussants will be allotted two minutes; in addition, each follow-up discussant should verbally disclose financial relationships with any commercial interest that are relevant to the paper about to be discussed. The total amount of time provided for discussion is fifteen minutes. Please note the use of slides will NOT be permitted for discussants.

SPEAKER READY ROOM: The Speaker Ready Room is located in Room 501. Authors are requested to submit their PowerPoint presentations on USB memory drive or CD-ROM the day *prior* to their session to the technician in the Speaker Ready Room. Speaker Ready Room hours are:

| | |
|-----------------------------------|----------------------|
| Wednesday, April 19 th | 2:00 p.m.–6:00 p.m. |
| Thursday, April 20 th | 7:00 a.m.–5:15 p.m. |
| Friday, April 21 st | 7:30 a.m.–5:00 p.m. |
| Saturday, April 22 nd | 7:30 a.m.–11:00 a.m. |

EMBARGO POLICY: The embargo on studies and their associated abstracts (including those posted online prior to the conference) scheduled for presentation at the American Surgical Association’s 137th Annual Meeting, April 20–22, 2017, Philadelphia, Pennsylvania, is the date and time of each individual scientific presentation (not the beginning of the overall session in which it has been scheduled). News media activities are restricted until the embargo lifts. Any news media activity about a study and its associated abstract must include the following: “The complete manuscript of this study and its presentation at the American Surgical Association’s 137th Annual Meeting, April 20–22, 2017, Philadelphia, Pennsylvania, is anticipated to be published in the *Annals of Surgery* pending editorial review.”

BANQUET: The Annual Reception and Banquet is open to Fellows of the Association and their registered spouses/partners, as well as Invited Guest Physicians and Residents and their registered spouses/partners. The Reception and Banquet is scheduled for Friday, April 21st, with the reception taking place in the Grand Ballroom Salons A - F Foyer and dinner in Grand Ballroom Salons A - F (*black tie preferred, but dark suits are acceptable*).

SPECIAL EVENTS:

Address by the President: Thursday, April 20th 10:50 a.m.

“Surgical Mentorship: A Great Tradition, but Can We Do Better for the Next Generation?”

Forum Discussion Friday, April 21st 10:30 a.m.

“A Lifetime of Surgical Education: Can We Do Better?”

Executive Session (Fellows Only) Friday, April 21st 4:00 p.m.

Reception & Banquet Friday, April 21st 7:00 p.m.

SPOUSE/GUEST HOSPITALITY: The Spouse/Guest Hospitality Suite is located in Room 409 from 7:00 a.m. to 10:30 a.m., Thursday, April 20th, through Saturday, April 22nd. The Local Arrangements Committee will have information on activities of interest and maps available in the room.

REGISTRANT BADGES: Badges are required for admittance to the ASA Scientific Sessions. Badge colors represent the following designations:

Blue — Member/Fellow
 Cream — Honorary Fellow
 Green — Guest Physician
 White — Spouse/Guest

CME MISSION/PURPOSE AND CONTENT

The Continuing Medical Education Mission of the American Surgical Association is to provide a national forum for presenting the developing state-of-the-art and science of general and sub-specialty surgery and the elevation of the standards of the medical/surgical profession. This mission is accomplished primarily by conducting an annual scientific meeting consisting of selected presentations containing the most current information available on clinical and research topics related to surgery or surgical specialties, including studies on outcomes, practice and science of surgery and ethical and other issues that affect its practice. In addition, the meeting features special invited speakers who address a variety of topics directly or indirectly related to the practice of surgery. The meeting is presented for the benefit of those physicians, surgeons and researchers involved in the study, treatment and cure of diseases associated with the entire spectrum of human disease. The meeting provides for a free exchange of information and serves the professional needs of the membership and invited guests. The Association's mission is augmented by the publication of the scientific papers presented at the annual meeting in the *Annals of Surgery*, a monthly scientific publication distributed to subscribers throughout the world and by the publication of the Proceedings of the Annual Meeting and the scientific papers in the *Transactions of the American Surgical Association*, an annual publication distributed to the membership.

LEARNING OBJECTIVES

The Annual Meeting of the American Surgical Association is designed to provide two and one half days of comprehensive educational experiences in the fields of clinical surgery, experimental surgery and related sciences, surgical education and the socioeconomic aspects of surgical care. It is the Association's intent to bring together at this meeting the leading surgeons and scientists from North America and other continents to freely and openly discuss their latest clinical and research findings.

LEARNING OUTCOMES

At the conclusion of the Annual Meeting, participants should have an enhanced understanding of the latest techniques and current research specifically related to the fields of clinical surgery, experimental surgery and related sciences, surgical education and the socioeconomic aspects of surgical care. Through the open discussion periods and the Forum Discussion, participants will have the opportunity to hear the pros and cons of each paper presented to gain an overall perspective of their current practices and to utilize results presented in order to select appropriate surgical procedures and interventions for their own patients and to integrate state-of-the-art knowledge into their current practice and/or research.

EDUCATIONAL METHODS

Authored papers supported by audio/visual presentations, panel discussion, and open group discussion.

CONTINUING MEDICAL EDUCATION CREDIT INFORMATION

Accreditation

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the American College of Surgeons and American Surgical Association. The American College of Surgeons is accredited by the ACCME to provide continuing medical education for physicians.

AMA PRA Category 1 Credits™

The American College of Surgeons designates this live activity for a maximum of 16.00 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Of the AMA PRA Category 1 Credits™ listed above, a maximum of 13.50 credits meet the requirements for Self-Assessment.



AMERICAN COLLEGE OF SURGEONS
Inspiring Quality:
Highest Standards. Better Outcomes



AMERICAN COLLEGE OF SURGEONS
DIVISION OF EDUCATION
Accredited with Commendation by the
Accreditation Council for Continuing Medical Education

FACULTY DISCLOSURE INFORMATION

In compliance with ACCME Accreditation Criteria, the American College of Surgeons, as the accredited provider of this activity, must ensure that anyone in a position to control the content of the educational activity has disclosed all relevant financial relationships with any commercial interest. All reported conflicts are managed by a designated official to ensure a bias-free presentation.

In accordance with the ACCME Accreditation Criteria, the American College of Surgeons, as the accredited provider of this activity, must ensure that anyone in a position to control the content of the educational activity has disclosed all relevant financial relationships with any commercial interest. Therefore, it is mandatory that both the program planning committee and speakers complete disclosure forms. Members of the program committee were required to disclose all financial relationships and speakers were required to disclose any financial relationship as it pertains to the content of the presentations. The ACCME defines a ‘commercial interest’ as “any entity producing, marketing, re-selling, or distributing health care goods or services consumed by, or used on, patients”. It does not consider providers of clinical service directly to patients to be commercial interests. The ACCME considers “relevant” financial relationships as financial transactions (in any amount) that may create a conflict of interest and occur within the 12 months preceding the time that the individual is being asked to assume a role controlling content of the educational activity.

ACS is also required, through our joint providership partners, to manage any reported conflict and eliminate the potential for bias during the activity. All program committee members and speakers were contacted and the conflicts listed below have been managed to our satisfaction. However, if you perceive a bias during a session, please report the circumstances on the session evaluation form.

Please note we have advised the speakers that it is their responsibility to disclose at the start of their presentation if they will be describing the use of a device, product, or drug that is not FDA approved or the off-label use of an approved device, product, or drug or unapproved usage.

The requirement for disclosure is not intended to imply any impropriety of such relationships, but simply to identify such relationships through full disclosure and to allow the audience to form its own judgments regarding the presentation.

New Honorary Fellows Introductions

Masaru Miyazaki, M.D.



Masaru Miyazaki is Director and Professor of the International University of Health and Welfare (IUHW) Mita Hospital, Tokyo, Japan and Vice President of the IUHW, and Professor Emeritus, Department of General Surgery, Chiba University Graduate School of Medicine. He was awarded a doctorate of medicine in 1975 and a PhD in 1983 from Chiba University. After his surgical training at Chiba University he served as a research fellow under Professor Rudy Falk at the University of Toronto in 1981 and 1982. He has been on the faculty of Chiba University since 1983 during which time he served in many distinguished leadership roles including Professor & Chairman, Department of Surgery, Chiba University 2001–2016, Vice President of Chiba University 2011–2013 and Director of Chiba University Hospital 2011–2014. His primary academic focus has been on gastric, hepatopancreatic and biliary cancers. He has authored or co-authored 437 papers in high impact journals. He served as Chairman of the Japanese Guidelines for the management of biliary tract cancers and the General Rules Committee for Clinical & Pathological Studies on Cancer of the Biliary Tract. He was honored as the 49th Congress-President of the Japan Biliary Association in 2015 and awarded Honorary Membership. In addition he served as President of the Japan Society of Hepato-Biliary Pancreatic Surgery 2012–2016 and was the 112th President of The Japan Surgical Society. He was awarded an honorary membership of the Egyptian Society of Surgeons in 2010 and the European Surgical Association in 2014, and the Brazilian Society of Surgical Oncology (BSSO) 2015.

Graeme John Poston, M.D.

Graeme Poston is a consultant hepato-biliary surgeon at University Hospital Aintree, Liverpool, UK, and Professor of Surgery in the School of Translational Studies of the University of Liverpool. Professor Poston gained his undergraduate medical training at St. Georges Hospital Medical School, London, graduating in 1979, and postgraduate training at The Hammersmith Hospital and St Mary's Hospital, London, and University of Texas Medical Branch, Galveston, Texas.

Professor Poston enjoys an international reputation in hepatobiliary surgery. His unit at UHA is one of the largest tertiary resectional hepato-biliary practices in the UK, having performed over 2,000 liver resections over the last 25 years.

Dr. Poston is the Chair of the Editorial Advisory Board of the European Journal of Surgical Oncology and a Past-President of the European Society of Surgical Oncology, the Association of Upper Gastrointestinal Surgeons of Great Britain and Ireland, and the British Association of Surgical Oncology. He is a Past-Chair of NHS England HPB Specialised Commissioning, NHS England Specialised Commissioning Internal Medicine Programme of Care, NICE Colorectal Cancer Guideline Development Group and Quality Standards Committee, and the Cancer Services Committee of the Royal College of Surgeons of England. He is the principal investigator of a number of ongoing national and international clinical trials in hepato-biliary surgery, and co-author of numerous national and international guidelines for the management of Hepatobiliary cancers, ten textbooks of surgery, and over 240 papers.

Honours and distinctions include Doctorate of Science honoris causa, King George V Medical University, Lucknow, the Ernest Miles Medal of the Royal Marsden Surgical Society, Olaf ac Acrel Medal of the Swedish Surgical Association, Stanford Cade Medal of the Royal College of Surgeons of England, Kilroe Medal of the Christie Hospital, Manchester, N K Misra Medal of the Indian Association of Surgical Oncology, Honorary Fellow of the Association of Surgeons of India and the College of Surgeons of Sri Lanka, Hunterian Professor of the Royal College of Surgeons of England, and numerous international visiting Professorships. In what little spare time he has, he enjoys trekking in high places (climbed Kilimanjaro, trekked to Everest and Annapurna Base Camps, climbing Kala Pattar en route, and crossed the Lakya La).

Cheng-Har Yip, M.D.

Dr. Yip was born in Kampar, Malaysia, and received her medical degree from the University of Malaya in 1981. She became a fellow of the Royal College of Surgeons (Glasgow, 1985) and joined the faculty of Medicine at the University of Malaya in 1986. She pioneered multidisciplinary breast cancer treatment clinics in Malaysia.

Dr. Yip has been continuously funded for her breast cancer research since 1995. Dr. Yip has over 180 publications in peer reviewed journals and an H index of 23. During her

26 years in the University of Malaya, Dr. Yip has taught countless medical students, and supervised scores of Master of Surgery as well as MSc and Phd students, many of whom have gone on to become professors and consultant surgeons.

Dr. Yip has held many important administrative roles, including Head of Surgery Department. She was the Chairman of the Development Committee of National Clinical Practice Guidelines for the Management of Breast Cancer in Malaysia, was the chairman of the Breast and Endocrine Surgery Credentialing Committee for the National Specialist Register in Malaysia, and is currently a member of the General Surgery Credentialing Committee. She has served as technical advisor to the Breast Cancer Welfare Association of Malaysia.

She was a past-president of the Association of University Surgeons of Asia (2003–2005), the President of the College of Surgeons of Malaysia (2010–2013), the President of the Asia Pacific Organization for Cancer Prevention (2010–2012), and current President of Breast Surgery International. She has been appointed an expert in cancer control by the WHO and the International Atomic Energy Agency (IAEA), and has been on expert panels in international organizations such as the International Cancer Control Conference, the Breast Health Global Initiative, and the International Consortium of Health Outcome Measures.

She has received many national and international honors including the UICC 2009 Reach to Recovery International Health Professional Award. She was awarded the Malaysian “Greatest Women of our Times” award in 2009. In 2012, she was given the title of Dato’ from the Sultan of Perak (DPMP).

For her scientific accomplishments in breast cancer, for her leadership in clinical and public health, for her contributions to international surgery, we welcome her as honorary fellow to the American Surgical Association.

SCHEDULE-AT-A-GLANCE

THURSDAY, APRIL 20th

- 8:15 AM **Opening Session** Grand Ballroom Salons A - F
- President’s Opening Remarks
- Secretary’s Welcome & Introduction of
New Fellows Elected In 2016
- President’s Introduction of Honorary Fellows
- Presentation of the Medallion for the Advancement of
Surgical Care
- Past President Eulogy
- Report of the Committee on Arrangements
- 9:10 AM **Scientific Session I** Grand Ballroom Salons A - F
Moderator: Keith D. Lillemoe, M.D.
- 10:50 AM **Presidential Address** Grand Ballroom Salons A - F
**“Surgical Mentorship: A Great Tradition, but Can We Do
Better for the Next Generation?”**
Introduction: Theodore N. Pappas, M.D.
Address: Keith D. Lillemoe, M.D.
- 1:30 PM **Scientific Session II** Grand Ballroom Salons A - F
Moderator: Ronald V. Maier M.D.

FRIDAY, APRIL 21st

- 7:00 AM **ASA Women in Surgery Breakfast** Franklin 13
- 8:00 AM **Scientific Session III** Grand Ballroom Salons A - F
Moderator: Keith D. Lillemoe, M.D.
- 10:30 AM **Forum Discussion:** Grand Ballroom Salons A - F
“A Lifetime of Surgical Education: Can We Do Better?”
Moderator: Keith D. Lillemoe, M.D.
- 1:30 PM **Scientific Session IV** Grand Ballroom Salons A - F
Moderator: Theodore N. Pappas, M.D.
- 4:00 PM **Executive Session** Grand Ballroom Salons A - F
(Fellows Only)
Presentation of the Flance-Karl Award
- 7:00 PM **Annual Reception** Grand Ballroom Salons A - F Foyer
(Black tie preferred, but dark suits are acceptable.)
- 8:00 PM **Annual Banquet** Grand Ballroom Salons A – F
(Black tie preferred, but dark suits are acceptable.)

SATURDAY, APRIL 22nd

- 8:00 AM **Scientific Session V** Grand Ballroom Salons A – F
Moderator: New President-Elect
- 11:00 AM **Adjourn**

**AMERICAN SURGICAL ASSOCIATION
137th Annual Meeting | April 20–22, 2017
Philadelphia Downtown Marriott | Philadelphia, Pennsylvania**

PROGRAM OUTLINE**THURSDAY, APRIL 20, 2017****8:15 AM – 9:10 AM****OPENING SESSION
Grand Ballroom Salons A - F**

President's Opening Remarks

Secretary's Welcome & Introduction of New Fellows Elected in 2016

President's Introduction of Honorary Fellows

Presentation of the Medallion for the Advancement of Surgical Care

Past President Eulogy

Report of the Committee on Arrangements

9:10 AM – 10:50 AM

**SCIENTIFIC SESSION I
Grand Ballroom Salons A - F**

Moderator: Keith D. Lillemoe, M.D.

9:10 AM – 9:35 AM

1

Outcomes of Concurrent Operations: Results from the American College of Surgeons' National Surgical Quality Improvement Program

Jason B. Liu*¹, Julia R. Berian*¹, Kristen A. Ban*¹, Yaoming Liu*¹, Mark E. Cohen*¹, Peter Angelos², Jeffrey B. Matthews², David B. Hoyt¹, Bruce L. Hall¹, Clifford Y. Ko¹

¹American College of Surgeons, Chicago, IL; ²University of Chicago Hospitals, Chicago, IL

9:35 AM – 10:00 AM

2

A Prospective Randomized Multicenter Trial of Distal Pancreatectomy with and without Routine Intraoperative Drainage

George Van Buren, II¹, Mark Bloomston*², Carl R. Schmidt*², Stephen W. Behrman*³, Nicholas J. Zyromski*⁴, Chad G. Ball*⁵, Katherine A. Morgan*⁶, Steve J. Hughes*⁷, Paul J. Karanicolas*⁸, John D. Allendorf*⁹, Charles M. Vollmer, Jr.¹⁰, Quan Ly*¹¹, Kimberly M. Brown¹², Vic Velanovich¹³, Jordan M. Winter*¹⁴, Amy L. McElhany¹, Peter Muscarella, II*², C. Max Schmidt⁴, Michael G. House*⁴, Elijah Dixon⁵, Mary E. Dillhoff*², Jose G. Trevino¹⁵, Julie Hallet*⁸, Natalie S.G. Coburn*⁸, Atilla Nakeeb*⁴, Kevin E. Behrs¹⁵, Aaron R. Sasson*¹¹, Eugene P. Ceppa*⁴, Sherif R.Z. Abdel-Misih*², Taylor S. Riall¹², Eric J. Silberfein¹, E. Christopher Ellison², David B. Adams⁶, Cary Hsu¹, Hop S. Tran Cao¹, Somala Mohammed¹, Nicole Villafañe Ferriol¹, Omar Barakat¹, Nader Massarweh¹, Christy Chai¹, J. Euberto Mendez¹, Andrew Fang¹, Eunji Jo¹, Mo Qianxing¹, William E. Fisher¹

*By invitation

¹Baylor College of Medicine, Houston, TX; ²The Ohio State University, Columbus, OH; ³Baptist Memorial Hospital/University of Tennessee Health Science Center, Memphis, TN; ⁴Indiana University, Indianapolis, IN; ⁵University of Calgary, Calgary, AB, Canada; ⁶Medical University of South Carolina, Charleston, SC; ⁷University of Florida, Gainesville, TX; ⁸Sunnybrook Health Sciences Centre, Toronto, ON, Canada; ⁹Winthrop University Hospital, Mineola, NY; ¹⁰University of Pennsylvania, Philadelphia, PA; ¹¹University of Nebraska Medical Center, Omaha, NE; ¹²The University of Texas Medical Branch, Galveston, TX; ¹³University of South Florida, Tampa, FL; ¹⁴Thomas Jefferson University, Philadelphia, PA; ¹⁵University of Florida, Gainesville, FL

10:00 AM – 10:25 AM

3

Firearm Deaths in America: Can We Learn from the Almost Half-Million Lives Lost?

Shelby Resnick, Randi N. Smith, Jessica Beard, Daniel N. Holena, Patrick M. Reilly, C. William Schwab, Mark J. Seamon

University of Pennsylvania, Philadelphia, PA

10:25 AM – 10:50 AM

4

Expanding the Margins: High Volume Utilization of Marginal Liver Grafts Among 2000 Liver Transplants at a Single Institution

Karim J. Halazun¹, Ralph C. Quillin², Tomoaki Kato², Craig R. Smith², Fabrizio Michelassi¹, Benjamin Samstein¹, James V. Guarerra², Robert S. Brown¹, Jean C. Emond²

¹Weill Cornell Medical College, New York, NY; ²Columbia University Medical Center, New York, NY

10:50 AM – 12:00 PM

**PRESIDENTIAL ADDRESS
Grand Ballroom Salons A - F**

10:50 AM – 11:00 AM

Introduction of the President

Theodore N. Pappas, M.D.

11:00 AM – 12:00 PM

Address by the President

“Surgical Mentorship: A Great Tradition, but Can We Do Better for the Next Generation?”

Keith D. Lillemoe, M.D.

1:30 PM – 5:15 PM

**SCIENTIFIC SESSION II
Grand Ballroom Salons A - F**

Moderator: Ronald V. Maier, M.D.

1:30 PM – 1:55 PM

5

Cytolytic Induction Therapy Improves Clinical Outcomes in African-American Kidney Transplant Recipients

David J. Taber, John McGillicuddy, Charles Bratton, Satish Nadig, Derek Dubay, Prabhakar Baliga

MUSC, Charleston, SC

1:55 PM – 2:20 PM

6

Axillary Dissection, Nodal Recurrence and Extent of RT in Z0011 Eligible Breast Cancer Patients: A Prospective Study

Monica Morrow, Kimberly Van Zee, Melissa Pilewskie, Mahmoud El-Tamer, Andrea Barrio, George Plitas, Lisa Sclafani, Laurie Kirstein, Sujata Patil, Hiram Cody, III

Memorial Sloan Kettering Cancer Center, New York, NY

2:20 PM – 2:45 PM

7

Improving Mortality and Decreasing VTE After Severe Traumatic Brain Injury: Low Molecular Weight Heparin Is Superior to Unfractionated Heparin

Elizabeth Benjamin, Gustavo Recinos, Alberto Aiolfi, Kenji Inaba, Demetrios Demetriades

USC Los Angeles County Medical Center, Los Angeles, CA

2:45 PM – 3:10 PM

8

Results of the First Prospective Multi-Institutional Treatment Study in Children with Bilateral Wilms Tumor (AREN0534) – A Report from the Children’s Oncology Group

Peter F. Ehrlich¹, Murali Chintagumpala², Yuen Chi³, Fred Hoffer⁴, Elizabeth Pearlman⁵, John Kalapurakal⁶, Anne Warwick⁷, Robert C. Shamberger⁸, Geetika Khanna⁹, Arnold Paulino¹⁰, Eric Gratiias¹¹, Elizabeth Mullen¹², James Geller¹³, Jeff Dome¹⁴, Michael Ritchey¹⁵

¹University of Michigan, Ann Arbor, MI; ²MD Anderson Baylor, Houston, TX; ³University of Florida, Gainesville, FL; ⁴University of Washington, Seattle, WA; ⁵Luire Childrens Hospital, Chicago, IL; ⁶Northwestern, Chicago, IL; ⁷Walter Reed Medical Center, Washinton, DC; ⁸Boston Childrens and Harvard University, Boston, MA; ⁹University of Washington at St. Louis, St. Louis, MO; ¹⁰MD Anderson, Houston, TX; ¹¹Childrens Oncology Group, Atlanata, GA; ¹²Dana Farber and Boston Childrens Hopsital, Boston, MA; ¹³University of Cincinnati, Cincinnati, OH; ¹⁴Children National Medical Center, Washington DC, DC; ¹⁵Phoenix Childrens Hosptial, Phoenix, AZ

3:10 PM – 3:35 PM**9****Intraoperative Molecular Imaging Is Superior to Positron Emission Tomography for Identifying Malignant Pulmonary Nodules**Jarrod D. Predina¹, Andrew Newton¹, Jane Keating¹, Olugbenga Okusanya², Jeffrey Drebin¹, Sunil Singhal¹¹University of Pennsylvania School of Medicine, Philadelphia, PA; ²University of Pittsburgh Medical Center, Pittsburgh, PA**3:35 PM – 4:00 PM****10****Laparoscopic Surgery for Small Bowel Obstruction Is Associated with a Higher Risk of Bowel Injury: A Population-Based Analysis of 8,584 Consecutive Patients**

Ramy Behman, Avery B. Nathens, James Byrne, Stephanie Mason, Nicole Look Hong, Paul J. Karanicolas

*University of Toronto, Toronto, ON, Canada***4:00 PM – 4:25 PM****11****Who Makes It to the End? A Novel Predictive Model for Identifying Surgical Residents at Risk of Dropping Out**Heather Yeo¹, Jonathan Abelson¹, Jialin Mao¹, Frank Lewis², Fabrizio Michelassi¹, Richard H. Bell³, Art Sedrakyan¹, Julie Sosa⁴¹New York Presbyterian Hospital – Weill Cornell Medicine, New York, NY; ²American Board of Surgery, Philadelphia, PA; ³Lewis Katz School of Medicine, Temple University, Philadelphia, PA; ⁴Duke University Medical Center, Durham, NC**4:25 PM – 4:50 PM****12****Trending Fibrinolytic Dysregulation: Changes in Fibrinolysis over Hospitalization Predict Poor Outcome in Severely-injured Children**

Christine Leeper, Matthew D. Neal, Christine McKenna, Barbara Gaines

*Children's Hospital of Pittsburgh of UPMC, Pittsburgh, PA***4:50 PM – 5:15 PM****13****The 5th Vital Sign: Postoperative Pain Predicts 30-Day Readmission and Emergency Department Visits**Mary T. Hawn¹, Laura Graham², Tyler Wahl³, Elise Aucoin², Karishma Desai¹, Melanie Morris², Kamal Itani³, Gordon Telford⁴, Joshua Richman⁵, Tina Hernandez-Boussard¹¹Stanford University, Stanford, CA; ²University of Alabama at Birmingham, Birmingham, AL; ³Boston VAMC, Boston, MA; ⁴Medical College of Wisconsin, Milwaukee, WI; ⁵University of Alabama at Birmingham, Birmingham, AL

FRIDAY, APRIL 21, 2017

6:30 AM – 8:00 AM

**ASA WOMEN IN SURGERY BREAKFAST
Franklin 13**

8:00 AM – 10:30 AM

**SCIENTIFIC SESSION III
Grand Ballroom Salons A - F**

Moderator: Keith D. Lillemoe, M.D.

8:00 AM – 8:25 AM

14

Impact of Pretransplant Bridging Locoregional Therapy for Patients with Hepatocellular Carcinoma within Milan Criteria Undergoing Liver Transplantation: Analysis of 3601 Patients from the US Multicenter HCC Transplant Consortium

Vatche G. Agopian¹, Michael P. Harlander-Locke¹, Richard M. Ruiz², Goran B. Klintmalm², Sander S. Florman³, Brandy Haydel³, Maarouf Hoteit⁴, David D. Lee⁵, C. Burcin Taner⁵, Elizabeth C. Verna⁶, Karim J. Halazun⁷, Amit D. Tevar⁸, Federico Aucejo⁹, William C. Chapman¹⁰, Neeta Vachharajani¹⁰, Marc L. Melcher¹¹, Mindie H. Nguyen¹¹, Trevor L. Nydam¹², Constance Mobley¹³, Mark R. Ghobrial¹³, Beth M. Amundsen¹⁴, James F. Markmann¹⁴, Alan N. Langnas¹⁵, Carol A. Carney¹⁵, Jennifer Berumen¹⁶, Alan W. Hemming¹⁶, Debra L. Sudan¹⁷, Johnny C. Hong¹⁸, Joohyun Kim¹⁸, Michael A. Zimmerman¹⁸, Abbas Rana¹⁹, Michael L. Kueht¹⁹, Christopher M. Jones²⁰, Thomas M. Fishbein^{*21}, Ronald W. Busuttil¹

*By invitation

¹Dumont UCLA Transplant Center, University of California, Los Angeles, Los Angeles, CA; ²Annette C. and Harold C. Simmons Transplant Institute, Baylor University Medical Center, Dallas, TX; ³Icahn School of Medicine at Mount Sinai, New York, NY; ⁴Penn Transplant Institute, University of Pennsylvania School of Medicine, Philadelphia, PA; ⁵Department of Transplantation, Mayo Clinic, Jacksonville, FL; ⁶New York Presbyterian Hospital, Columbia University Medical Center, New York, NY; ⁷New York Presbyterian Hospital, Weill Cornell Medical Center, New York, NY; ⁸Thomas E. Starzl Transplantation Institute, University of Pittsburgh Medical Center, Pittsburgh, PA; ⁹Cleveland Clinic Foundation, Cleveland, OH; ¹⁰Washington University School of Medicine, St. Louis, MO; ¹¹Stanford University Medical Center, Palo Alto, CA; ¹²Division of Transplant, University of Colorado School of Medicine, Denver, CO; ¹³Houston Methodist Hospital, Houston, TX; ¹⁴Division of Transplant Surgery, Massachusetts General Hospital, Harvard Medical School, Boston, MA; ¹⁵Section of Transplantation, University of Nebraska Medical Center, Omaha, NE; ¹⁶Division of Transplantation, Department of Surgery, University of California, San Diego, San Diego, CA; ¹⁷Division of Abdominal Transplant Surgery, Department of Surgery, Duke University Medical Center, Durham, NC; ¹⁸Division of Transplant Surgery, Department of Surgery, Medical College of Wisconsin, Milwaukee, WI; ¹⁹Division of Abdominal Transplantation, Baylor College of Medicine, Houston, TX; ²⁰Division of Transplant Surgery, Department of Surgery, University of Louisville School of Medicine, Louisville, KY; ²¹Medstar Georgetown Transplant Institute, Georgetown University, Washington, DC

8:25 AM – 8:50 AM**15****Should Patients with Cystic Lesions of the Pancreas Undergo Long-Term Radiographic Surveillance? Results of 3,024 Patients Evaluated at a Single Institution**

Sharon A. Lawrence, Marc A. Attiyeh, Kenneth Seier, Mithat Gonen, Vinod Balachandran, T. Peter Kingham, Michael I. D'Angelica, Ronald DeMatteo, Murray F. Brennan, William R. Jarnagin, Peter J. Allen

Memorial Sloan Kettering Cancer Center, New York, NY

8:50 AM – 9:15 AM**16****A Randomized Controlled Trial of Postoperative Thoracic Epidural Analgesia Versus Intravenous Patient Controlled Analgesia After Major Hepatopancreatobiliary Surgery**

Thomas A. Aloia*¹, Bradford J. Kim¹, Yun Shin Chun*¹, Juan P. Cata*¹, Mark J. Truty*², Alexander Holmes*¹, Jose M. Soliz*¹, Keyuri U. Popat*¹, Debra L. Kennamer*¹, Thomas F. Rahlfs*¹, Jeffrey E. Lee¹, Vijaya Gottumukkala*¹, Jean-Nicolas Vauthey¹

¹University of Texas MD Anderson Cancer Center, Houston, TX;

²Mayo Clinic, Rochester, MN

9:15 AM – 9:40 AM**17****Wide Variation and Over-Prescription of Opioids Following Elective Surgery**

Cornelius A. Thiels¹, Stephanie S. Anderson¹, Daniel S. Ubl¹, Kristine T. Hanson¹, Whitney J. Bergquist¹, Richard J. Gray², Halena M. Gazelka¹, Robert R. Cima¹, Elizabeth B. Habermann¹

¹Mayo Clinic, Rochester, MN; ²Mayo Clinic, Scottsdale, AZ

*By invitation

9:40 AM – 10:05 AM**18****Minimally Invasive Proctectomy Is Associated with Reduced Margin Positivity and Improved Survival in Patients with Locally Advanced Rectal Cancer**

Sarath Sujatha-Bhaskar, Mehraneh D. Jafari, John V. Gahagan, Steven Mills*, Joseph C. Carmichael*, Michael J. Stamos, Alessio Pigazzi*

University of California, Irvine School of Medicine, Orange, CA

10:05 AM – 10:30 AM**19****Readiness of US General Surgery Residents for Independent Practice**

Brian George¹, Jordan Bohnen², Reed Williams³, Shari Meyerson⁴, Mary Schuller⁴, Andreas Meier*⁵, Laura Torbeck³, Samuel Mandell⁶, John Mullen*², Douglas Smink*⁷, Jeffrey Chipman*⁸, Edward Auyan⁹, Kyla Terhune*¹⁰, Paul Wise*¹¹, Jennifer Choi*³, Eugene Foley¹², Justin Dimick¹, Michael Choti¹³, Nathaniel Soper⁴, Keith Lillemoe², Joseph Zwischenberger¹⁴, Gary Dunnington³, Debra DaRosa⁴, Jonathan Fryer⁴

¹University of Michigan, Ann Arbor, MI; ²Massachusetts

General Hospital, Boston, MA; ³Indiana University,

Indianapolis, IN; ⁴Northwestern University, Chicago, IL;

⁵SUNY Upstate, Syracuse, NY; ⁶University of Washington,

Seattle, WA; ⁷Brigham and Women's Hospital, Boston, MA;

⁸University of Minnesota, Minneapolis, MN; ⁹University of New

Mexico, Albuquerque, NM; ¹⁰Vanderbilt University, Nashville,

TN; ¹¹Washington University, Saint Louis, MO; ¹²University of

Washington, Madison, WI; ¹³University of Texas Southwestern,

Dallas, TX; ¹⁴University of Kentucky, Lexington, KY

*By invitation

10:30 AM – 12:00 PM**FORUM DISCUSSION** Grand Ballroom Salons A - F**A Lifetime of Surgical Education: Can We Do Better?***Moderator: Keith D. Lillemoe, M.D.***Training in Surgery: Identifying, Preparing, and Providing the Optimal Experience for Our Residents**

Mary E. Klingensmith, M.D.

*Washington University School of Medicine, St. Louis, MO***“Practice Ready”: Competency Assessment of the Finishing Surgical Resident**

Ara Darzi, M.D.

*Imperial College London, London, United Kingdom***Maintenance of Certification: The Reality of Sustaining Competency**

Spence M. Taylor, M.D.

*USC School of Medicine Greenville, Greenville, SC***1:30 PM – 4:00 PM****SCIENTIFIC SESSION IV
Grand Ballroom Salons A - F***Moderator: Theodore N. Pappas, M.D.***1:30 PM – 1:55 PM****20****Multicenter Randomized Prospective Trial of Blood Transfusion in Major Burn Injury**Tina L. Palmieri¹, James Holmes², Brett Arnoldo³, Michael Peck⁴, Bruce Potenza^{*5}, Amalia Cochran^{*6}, Booker King⁷, William Dominick^{*8}, Robert Cartotto^{*9}, Dhaval Havsar^{*10}, Nathan Kemalyan^{*11}, Edward Tredget¹², Francois Stapelberg¹³, David Mozingo^{*14}, David G. Greenhalgh¹, Bradley Pollock¹⁵*¹University of California Davis and Shriners Hospital for Children Northern California, Sacramento, CA; ²Wake Forest Baptist Health, Winston-Salem, NC; ³University of Texas Southwestern Medical Center, Dallas, TX; ⁴The Arizona Burn Center, Maricopa Medical Center, Phoenix, AZ; ⁵University of California San Diego, San Diego, CA; ⁶University of Utah Department of Surgery, Salt Lake City, UT; ⁷Institute of Surgical Research, San Antonio, TX; ⁸Community Regional Medical Center, Fresno, CA; ⁹Sunnybrook Health Sciences Centre, Toronto, ON, Canada; ¹⁰Kansas University Medical Center, Kansas City, KS; ¹¹Oregon Burn Center, Portland, OR; ¹²University of Alberta, Edmonton, AB, Canada; ¹³New Zealand National Burn Centre, Middlemore Hospital, Middlemore, New Zealand; ¹⁴University of Florida Health Science Center, Gainesville, FL; ¹⁵University of California Davis, Sacramento, CA*

**By invitation*

1:55 PM – 2:20 PM**21****Is Annual Surgical Volume Enough? The Role of Experience and Specialization on Inpatient Mortality Following Hepatectomy**

Daniel A. Hashimoto, Yanik J. Bababekov, Sahael M. Stapleton,
Keith D. Lillemoe, David C. Chang, Parsia A. Vagefi
Massachusetts General Hospital, Boston, MA

2:20 PM – 2:45 PM**22****Understanding and Resetting Radiosensitivity in Rectal Cancer**

Katherine A. Kelley, Shushan Rana, Rebecca Ruhl,
Christian Lanciault, John G. Hunter, Charles R. Thomas,
Sudarshan Anand, Vassiliki L. Tsikitis
Oregon Health and Sciences University, Portland, OR

2:45 PM – 3:10 PM**23****Impact of the Hospital Readmission Reduction Program on Surgical Readmissions Among Medicare Beneficiaries**

Andrew M. Ibrahim, Hari Nathan, Jyothi Thumma,
Justin B. Dimick
University of Michigan, Ann Arbor, MI

3:10 PM – 3:35 PM**24****Surgical Management of Gallbladder Cancer: Simple Versus Extended Cholecystectomy and the Role of Adjuvant Therapy**

Gyulnara G. Kasumova, Omidreza Tabatabaie,
Ayotunde B. Fadayomi, Sing Chau Ng, Jennifer F. Tseng
*Surgical Outcomes Analysis & Research, Beth Israel
Deaconess Medical Center, Boston, MA*

3:35 PM – 4:00 PM**25****Failure to Diagnose Hyperparathyroidism in 10,432 Patients with Hypercalcemia: Opportunities for System-Level Intervention to Increase Surgical Referrals and Cure**

Courtney Balentine, Rongbing Xie, James J. Kirklin,
Herbert Chen
University of Alabama at Birmingham, Birmingham, AL

4:00 PM – 5:00 PM**EXECUTIVE SESSION**

Grand Ballroom Salons A - F

*ASA Fellows Only***Presentation of the Flance-Karl Award****7:00 PM**

ANNUAL RECEPTION Grand Ballroom Salons A – F Foyer
Black tie is preferred, but dark suits are acceptable.

8:00 PM**ANNUAL BANQUET**

Grand Ballroom Salons A - F

Black tie is preferred, but dark suits are acceptable.

SATURDAY, APRIL 22, 2017

8:00 AM – 11:00 AM

SCIENTIFIC SESSION
Grand Ballroom Salons A - F

Moderator: New President-Elect

8:00 AM – 8:25 AM

26

Anatomical Resections Improve Disease Free Survival in Patients with KRAS-Mutated Colorectal Liver Metastases

Georgios Antonios Margonis¹, Stefan Buettner¹, Kazunari Sasaki¹, Nikolaos Andreatos¹, Jan N.M. IJzermans², Jeroen L.A. van Vugt², John L. Cameron¹, Jin He^{*1}, Christopher L. Wolfgang¹, Matthew Weiss^{*1}

¹Johns Hopkins Hospital, Baltimore, MD; ²Erasmus MC, Rotterdam, Netherlands

8:25 AM – 8:50 AM

27

Individualized Metabolic Surgery Score: Procedure Selection Based on Diabetes Severity

Ali Aminian¹, Stacy A. Brethauer¹, Amin Andalib², Amy S. Nowacki¹, Amanda Jimenez³, Ricard Corcelles³, Zubaidah NorHanipah¹, Suriya Punchai¹, Antonio M. Lacy^{*3}, Bartolome Burguera¹, Josep Vidal³, Philip R. Schauer¹

¹Cleveland Clinic, Cleveland, OH; ²McGill University, Montreal, QC, Canada³Hospital Clinic Universitari, Barcelona, Spain

*By invitation

8:50 AM – 9:15 AM

28

Perception of Safety of Surgical Practice Among Operating Room Personnel from Survey Data Is Associated with All-Cause 30-Day Postoperative Death Rate in South Carolina

George Molina^{*1}, William R. Berry^{*1}, Stuart R. Lipsitz^{*1}, Lizabeth Edmondson^{*1}, Zhonghe Li^{*1}, Bridget A. Neville^{*1}, Aunyika T. Moonan^{*2}, Lorri R. Gibbons^{*2}, Atul A. Gawande¹, Sara J. Singer^{*1}, Alex B. Haynes^{*1}

¹Ariadne Labs at Brigham and Women's Hospital and Harvard T.H. Chan School of Public Health, Boston, MA; ²South Carolina Hospital Association, Columbia, SC

9:15 AM – 9:40 AM

29

Tumor Biology and Response to Chemotherapy Impact Breast Cancer-Specific Survival in Node-Positive Breast Cancer Treated with Neoadjuvant Chemotherapy and Axillary Dissection: Long-Term Follow-Up from ACOSOG Z1071 (Alliance)

Judy C. Boughey¹, Karla Ballman², Linda McCall³, Elizabeth A. Mittendorf⁴, Thomas Julian⁵, David Byrd⁶, Kelly K. Hunt⁴

¹Mayo Clinic, Rochester, MN; ²Weill Cornell Medicine, NY, NY; ³Duke University, Durham, NC; ⁴MD Anderson Cancer Center, Houston, TX; ⁵Allegheny General Hospital, Pittsburgh, PA; ⁶University of Washington Medical Center, Seattle, WA

*By invitation

9:40 AM – 10:05 AM**30****Molecular Adsorbent Recirculating System (MARS) Effectively Replaces Hepatic Function in Severe Acute Liver Failure (ALF)**Steven I. Hanish¹, Rolf N. Barth¹, Deborah M. Stein², Eno-obong Essien¹, Paul Thurman², Stephen T. Bartlett¹, Thomas M. Scalea²¹University of Maryland School of Medicine, Baltimore, MD;²R. Adams Cowley Shock Trauma Center, Baltimore, MD**10:05 AM – 10:30 AM****31****Health-Related Quality of Life and Functional Outcomes in 5-year Survivors After Pancreaticoduodenectomy**Zhi Ven Fong¹, Donna M. Alvino¹, Carlos Fernández-del Castillo¹, Ryan D. Nipp¹, Lara N. Traeger¹, Margaret Ruddy¹, Carrie C. Lubitz¹, Colin D. Johnson², David C. Chang¹, Andrew L. Warshaw¹, Keith D. Lillemoe¹, Cristina R. Ferrone¹¹Massachusetts General Hospital, Boston, MA; ²University of Southampton, Southampton, United Kingdom**10:30 AM – 10:55 AM****32****Prediction of Recurrence Beyond Milan Criteria After Resection of Hepatocellular Carcinoma – An International Validation of a Clinical Risk Score**Jian Zheng¹, Joanne Chou¹, Mithat Gonen¹, Neeta Vachharajani², William C. Chapman², Maria B. Majella Doyle^{*2}, Simon Turcotte^{*3}, Franck Vandenbroucke-Menu^{*3}, Réal Lapointe³, Stefan Buettner⁴, Bas Groot Koerkamp^{*4}, Chung Yip Chan^{*5}, Brian KP Goh^{*5}, Jin Yao Teo^{*5}, Juinn Huar Kam^{*5}, Jeyaraj P. Raj^{*5}, Peng Chung Cheow^{*5}, Alexander Y.F. Chung^{*5}, Pierce K.H. Chow⁶, London L.P.J. Ooi^{*5}, Vinod P. Balachandran^{*1}, T. Peter Kingham^{*1}, Peter J. Allen¹, Michael I. D'Angelica¹, Ronald P. DeMatteo¹, William R. Jarnagin¹, Ser Yee Lee^{*5}¹Memorial Sloan Kettering Cancer Center, New York, NY;²Washington University School of Medicine, St. Louis, MO;³Université de Montréal, Montreal, QC, Canada; ⁴ErasmusMedical Center, Rotterdam, Netherlands; ⁵Singapore GeneralHospital, Singapore, Singapore; ⁶Singapore General Hospital and National Cancer Center, Singapore, Singapore**11:00 AM ADJOURN**

^{*}By invitation

PROGRAM DETAIL AND ABSTRACTS**THURSDAY MORNING, APRIL 20th**

8:15 AM – 9:10 AM
OPENING SESSION
Grand Ballroom Salons A - F

President's Opening Remarks

Secretary's Welcome & Introduction of
 New Fellows Elected In 2016

President's Introduction of Honorary Fellows

Presentation of the Medallion for the Advancement
 of Surgical Care

Past President Eulogy

Report of the Committee on Arrangements

THURSDAY MORNING, APRIL 20th, CONTINUED

9:10 AM – 10:50 AM
Grand Ballroom Salons A - F

SCIENTIFIC SESSION I

Moderator: Keith D. Lillemoe, M.D.

1

**Outcomes of Concurrent Operations: Results from the
 American College of Surgeons' National Surgical Quality
 Improvement Program**

Jason B. Liu*¹, Julia R. Berian*¹, Kristen A. Ban*¹,
 Yaoming Liu*¹, Mark E. Cohen*¹, Peter Angelos²,
 Jeffrey B. Matthews², David B. Hoyt¹, Bruce L. Hall¹,
 Clifford Y. Ko¹

¹American College of Surgeons, Chicago, IL; ²University of
 Chicago Hospitals, Chicago, IL

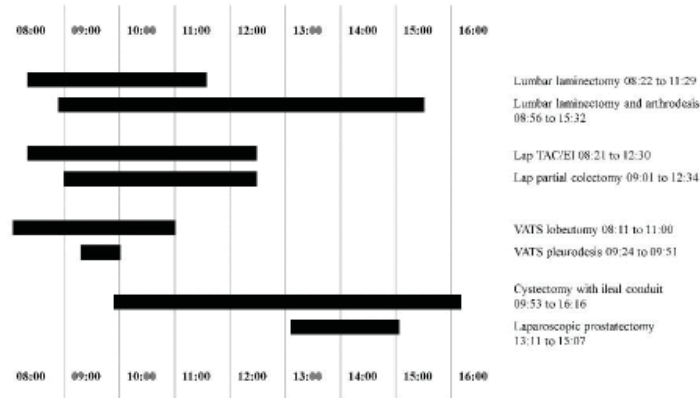
OBJECTIVE(S): Concurrent operations occur when a surgeon is responsible for two or more operations occurring simultaneously. Whether this practice affects patient outcomes is unknown.

METHODS: Using ACS NSQIP data from 2014–2015, operations were considered concurrent if they overlapped by ≥ 60 minutes or in their entirety (Figure). Propensity-score-matched cohorts were constructed to compare death or serious morbidity (DSM), unplanned reoperation, and unplanned readmission in concurrent versus non-concurrent operations. Multilevel hierarchical regression was used to account for the clustered nature of the data while controlling for procedure and case mix. Hospital characteristics were also considered.

RESULTS: There were 1,430 (32.3%) surgeons from 390 (77.7%) hospitals who performed 12,010 (2.3%) concurrent operations. Plastic Surgery (n = 393 [13.7%]), Otolaryngology (n = 470 [11.2%]), and Neurosurgery (n = 2067 [8.4%]) were specialties with the highest proportion of concurrent operations. Spine procedures were the most frequent concurrent procedures overall (n = 2,059/12,010 [17.1%]). Before propensity score matching,

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unadjusted rates of DSM (9.0% vs. 7.1%, $p < 0.001$), reoperation (3.6% vs. 2.7%, $p < 0.001$), and readmission (6.9% vs. 5.1%, $p < 0.001$) were greater in the concurrent operation cohort. After matching and risk-adjustment, there was no significant association of concurrence with DSM (adjusted odds ratio [aOR] 1.08; 95% CI 0.96–1.21), reoperation (aOR 1.16; 95% CI 0.96–1.40), or readmission (aOR 1.14; 95% CI 0.99–1.29).



CONCLUSIONS: Concurrent operations at ACS NSQIP hospitals were not associated with increased risk for poor outcomes when compared to non-concurrent operations. These results do not preclude continuous self-regulation and proactive disclosure of its practice. **FIGURE.** Representative concurrent operations included in the study.

2

A Prospective Randomized Multicenter Trial of Distal Pancreatectomy with and without Routine Intraoperative Drainage

George Van Buren, II¹, Mark Bloomston^{*2}, Carl R. Schmidt^{*2}, Stephen W. Behrman^{*3}, Nicholas J. Zyromski^{*4}, Chad G. Ball^{*5}, Katherine A. Morgan^{*6}, Steve J. Hughes^{*7}, Paul J. Karanicolas^{*8}, John D. Allendorf^{*9}, Charles M. Vollmer, Jr.¹⁰, Quan Ly^{*11}, Kimberly M. Brown¹², Vic Velanovich¹³, Jordan M. Winter^{*14}, Amy L. McElhany¹, Peter Muscarella, II^{*2}, C. Max Schmidt⁴, Michael G. House^{*4}, Elijah Dixon⁵, Mary E. Dillhoff^{*2}, Jose G. Trevino¹⁵, Julie Hallett^{*8}, Natalie S.G. Coburn^{*8}, Atilla Nakeeb^{*4}, Kevin E. Behrns¹⁵, Aaron R. Sasson^{*11}, Eugene P. Ceppa^{*4}, Sherif R.Z. Abdel-Misih^{*2}, Taylor S. Riall¹², Eric J. Silberfein¹, E. Christopher Ellison², David B. Adams⁶, Cary Hsu¹, Hop S. Tran Cao¹, Somala Mohammed¹, Nicole Villafañe Ferriol¹, Omar Barakat¹, Nader Massarweh¹, Christy Chai¹, J. Euberto Mendez¹, Andrew Fang¹, Eunji Jo¹, Mo Qianxing¹, William E. Fisher¹

¹Baylor College of Medicine, Houston, TX; ²The Ohio State University, Columbus, OH; ³Baptist Memorial Hospital/University of Tennessee Health Science Center, Memphis, TN; ⁴Indiana University, Indianapolis, IN; ⁵University of Calgary, Calgary, AB, Canada; ⁶Medical University of South Carolina, Charleston, SC; ⁷University of Florida, Gainesville, TX; ⁸Sunnybrook Health Sciences Centre, Toronto, ON, Canada; ⁹Winthrop University Hospital, Mineola, NY; ¹⁰University of Pennsylvania, Philadelphia, PA; ¹¹University of Nebraska Medical Center, Omaha, NE; ¹²The University of Texas Medical Branch, Galveston, TX; ¹³University of South Florida, Tampa, FL; ¹⁴Thomas Jefferson University, Philadelphia, PA; ¹⁵University of Florida, Gainesville, FL

OBJECTIVE(S): The use of routine intraoperative drains during distal pancreatectomy (DP) is controversial. The objective of this study was to test the hypothesis that DP without intraoperative drainage does not affect the frequency or severity of complications.

METHODS: Patients undergoing DP for all causes at 14 high-volume pancreas centers were preoperatively randomized to placement of a drain or no drain. Complications and their severity were tracked for 60 days and mortality for 90 days. The study was powered to detect a 10% positive or

*By invitation

negative difference in number of \geq grade 2 complications. All data were collected prospectively and source documents were reviewed at the coordinating center to confirm completeness and accuracy.

RESULTS: 344 patients underwent DP with (n = 174) and without (n = 170) the use of intraperitoneal drainage. There were no differences between cohorts in demographics, comorbidities, pathology, pancreatic duct size, pancreas texture, or operative technique. There was no difference in the number of patients with at least one \geq grade 2 complication (76/44% vs. 72/42%, p = 0.80) or mortality (0/0% vs. 2/1%, p = 0.24). There was no difference in clinically relevant postoperative pancreatic fistula (31/18% vs. 20/12%, p = 0.11). DP without routine intraperitoneal drainage was associated with a higher incidence of intra-abdominal fluid collection (18/10% vs. 41/24%, p = 0.001). There was no difference in percutaneous drain placement, reoperation, readmission, or quality of life scores.

CONCLUSIONS: This prospective randomized multicenter trial provides evidence that clinical outcomes are comparable in DP with or without intraperitoneal drainage.

3

Firearm Deaths in America: Can We Learn from the Almost Half-Million Lives Lost?

Shelby Resnick, Randi N. Smith, Jessica Beard,
Daniel N. Holena, Patrick M. Reilly, C. William Schwab,
Mark J. Seamon

University of Pennsylvania, Philadelphia, PA

OBJECTIVES: National campaigns have focused on decreasing mortality in firearm victims, but research on preventing firearm violence itself remains negligible. We sought to determine 1) if restrictive gun legislation correlates with decreased firearm death rates (FDR), and 2) whether restrictive legislation is related to decreased FDR in all population subsets.

METHODS: Demographic and intent data on FDR (1999–2013) was collected from the CDC WISQARS database and compared with Brady Center state firearm legislation rankings. Least restrictive states (Brady “F”) were compared to more restrictive states (Brady “A-D”) during 3 distinct periods (1999–2003/2004–2008/2009–2013). Our primary endpoint, FDR, was evaluated with Student’s t-test and $p \leq 0.05$ was significant.

RESULTS: During 1999–2013, 462,043 firearm deaths occurred at a rate which was unchanged during the 3 measured periods ($10.89 \pm 3.99/100,000$; $10.71 \pm 3.93/100,000$; $11.14 \pm 3.91/100,000$; $p > 0.05$). Within each period, “F” states had greater accidental, pediatric and adult suicide, Caucasian and overall FDR than “A-D” states (Table, all $p \leq 0.05$). Conversely, no correlation was seen, during any of the 3 time periods, with either homicide or Black FDR—population subsets which accounted for 42.1% of all firearm deaths.

| | Brady “A-D” States | Brady “F” States | p-value |
|---------------------|-----------------------|---------------------|---------|
| 1999–2003 | | | |
| All Firearm | 10.00 \pm 3.63 | 15.57 \pm 2.06 | <0.001 |
| Accidental | 0.27 \pm 0.18 | 0.71 \pm 0.19 | <0.001 |
| Pediatric (<14 yrs) | 0.75 \pm 0.53 | 1.36 \pm 0.75 | 0.06 |
| Suicide | 6.40 \pm 2.51 | 10.09 \pm 1.93 | 0.001 |
| Homicide | 3.12 \pm 1.73 | 4.45 \pm 3.03 | 0.09 |
| White | 9.24 \pm 3.54 | 14.77 \pm 1.72 | <0.001 |
| Black | 16.88 \pm 8.10 | 17.99 \pm 10.30 | 0.78 |

continued

| | Brady "A-D" States | Brady "F" States | p-value |
|---------------------|-----------------------|---------------------|---------|
| 2004–2008 | | | |
| All Firearm | 7.49 ± 3.45 | 11.85 ± 3.46 | 0.001 |
| Accidental | 0.11 ± 0.09 | 0.28 ± 0.23 | 0.010 |
| Pediatric (<14 yrs) | 0.35 ± 0.31 | 0.71 ± 0.47 | 0.003 |
| Suicide | 3.57 ± 1.76 | 7.94 ± 2.14 | <0.001 |
| Homicide | 3.63 ± 1.83 | 3.36 ± 2.23 | 0.66 |
| White | 5.83 ± 2.61 | 11.09 ± 3.13 | <0.001 |
| Black | 16.70 ± 8.96 | 14.42 ± 9.04 | 0.44 |
| 2009–2013 | | | |
| All Firearm | 8.42 ± 3.13 | 13.64 ± 2.71 | <0.001 |
| Accidental | 0.12 ± 0.12 | 0.30 ± 0.19 | <0.001 |
| Pediatric (<14 yrs) | 0.44 ± 0.31 | 0.83 ± 0.54 | 0.003 |
| Suicide | 5.24 ± 2.24 | 9.53 ± 2.12 | <0.001 |
| Homicide | 2.86 ± 1.63 | 3.50 ± 2.18 | 0.24 |
| White | 8.60 ± 3.17 | 13.81 ± 2.70 | <0.001 |
| Black | 14.92 ± 8.06 | 12.79 ± 9.24 | 0.39 |

CONCLUSIONS: Restrictive firearm legislation is associated with decreased pediatric, accidental, suicide and overall FDR, but homicide and Black American FDR appear unaffected by restrictive measures. Adequate firearm injury prevention funding and research are essential initial steps towards creating effective legislation that protects all segments of the American population.

4

Expanding the Margins: High Volume Utilization of Marginal Liver Grafts Among 2000 Liver Transplants at a Single Institution

Karim J. Halazun¹, Ralph C. Quillin², Tomoaki Kato², Craig R. Smith², Fabrizio Michelassi¹, Benjamin Samstein¹, James V. Guarerra², Robert S. Brown¹, Jean C. Emond²

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OBJECTIVE: Liver transplant (LT) centers have attempted to expand the donor pool by using marginal livers (ML). National utilization of MLs is variable, and in some centers they are never used. We examined outcomes of MLs in the largest single institution series of MLs used to date and compare outcomes to standard (SL) and living donor (LD) livers.

METHODS: Analysis of a prospectively maintained database of LTs performed at our institution from 1998–2016. Table 1 summarizes criteria used to define ML grafts.

RESULTS: 2000 LT recipients were studied. Of these 928 (46%) met ML criteria. Table-1 summarizes the results. ML recipients were more likely to have lower MELD and have HCV or HCC. Most MLs used were from organs turned down regionally and shared nationally (69%) or donors >70 (22%). Survival of patients receiving MLs did not significantly differ from patients receiving SL grafts (p = 0.08). Both ML and SL recipients had worse survival than LDs (p < 0.01). Despite nearly half our recipients receiving MLs, overall survival was significantly better than national outcomes over the same time period (p = 0.04). Our waitlist mortality remained significantly lower than national results (17.7% vs. 23.0% p < 0.0001). Conclusions Outcomes of recipients of ML grafts at our institution are comparable to SL transplants. Despite liberal use of MLs, we have been able to exceed national survival metrics while successfully expanding the existing donor pool.

Table 1: Summary of Criteria Defining ML and Comparison of Demographics and Outcomes Between Grafts

| | Marginal Liver (ML) 46.4% (n = 928) | Standard Liver (SL) 37.5% (n = 749) | Living Donor Liver (LD) 15.6% (n = 312) | p-Value |
|-----------------------------------|--|--|--|---|
| ML Characteristics | | | | |
| • Donor Age > 70 | 205 (22.1%) | NA | NA | NA |
| • CIT > 12 Hrs | 58 (6.3%) | NA | NA | NA |
| • Nationally Shared Organs | 640 (69%) | NA | NA | NA |
| • DCD | 44 (4.7%) | NA | NA | NA |
| • Partial Grafts | 91 (9.8%) | NA | NA | NA |
| • >30% Macro-steatosis | 36 (3.9%) | NA | NA | NA |
| • HCV +Ve Donor (HCV+) | 142 (15.3%) | NA | NA | NA |
| • >1 ECD Factor | 269 (28.5%) | NA | NA | NA |
| Recipient Demographics | | | | |
| • Mean Age | 46.7 ± 22.1yrs | 47.4 ± 19.1 yrs | 47.4 ± 19.1 yrs | 0.859 |
| • Gender (% Male) | 65.4% (n = 607) | 63.9% (n = 483) | 55.3% (n = 172) | 0.005 |
| • Median MELD (IQR) | 16 (IQR 11–22) | 21 (IQR 12–34) | 16 (IQR 11–20) | <0.001* |
| • Diagnosis of HCV | 35.2% (n = 329) | 31.6% (n = 239) | 20.6% (n = 64) | 0.002 |
| • Diagnosis of HCC | 27.4% (n = 254) | 20.6% (n = 156) | 9.3% (n = 29) | <0.001* |
| Outcomes | | | | |
| • Patient Survival at 1,3,5 years | 86%, 76%, 69% | 88%, 81%, 76% | 90%, 85%, 83% | ML vs. SL p = 0.08. LD vs ALL p < 0.01 |

Abbreviations: IQR: Interquartile Range, MELD: Model of End Stage Liver Disease, HCV: Hepatitis C, HCC: Hepatocellular carcinoma, CIT: Cold Ischemia Time, DCD: Non-Heart Beating Donor.

THURSDAY MORNING, APRIL 20th, CONTINUED

10:50 AM – 12:00 PM
Grand Ballroom Salons A - F

PRESIDENTIAL ADDRESS**Introduction of the President**

Theodore N. Pappas, M.D.

Address by the President

**“Surgical Mentorship: A Great Tradition,
but Can We Do Better for the Next Generation?”**

Keith D. Lillemoe, M.D.

THURSDAY AFTERNOON, APRIL 20th

1:30 PM – 5:15 PM
Grand Ballroom Salons A - F

SCIENTIFIC SESSION II

Moderator: Ronald V. Maier, M.D.

5

Cytolytic Induction Therapy Improves Clinical Outcomes in African-American Kidney Transplant Recipients

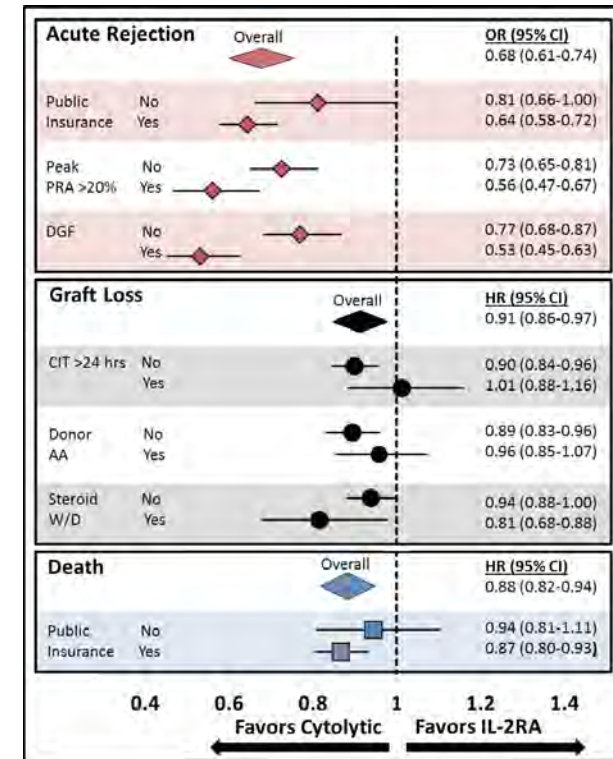
David J. Taber, John McGillicuddy, Charles Bratton, Satish Nadig, Derek Dubay, Prabhakar Baliga

MUSC, Charleston, SC

OBJECTIVE(S): African-Americans (AAs) are substantially under-represented in clinical trials; thus, controversy remains regarding the optimal choice of peri-operative antibody induction in kidney transplant (KTX).

METHODS: Analysis of US registry data from 1990–2009, comparing the impact of peri-operative cytolitic vs. IL-2 receptor antibody (IL-2RA) induction therapy on long-term outcomes in adult solitary AA KTX recipients. Multivariable logistic and Cox regression were utilized to assess the outcomes of acute rejection, graft loss and mortality, with interaction terms to assess for effect modification.

RESULTS: 25,084 adult AAs receiving solitary KTX were included, 16,927 (67.5%) received cytolitic induction and 8,157 (32.5%) received IL-2RA induction. After adjustment for recipient sociodemographics, donor and transplant characteristics (31 variables), the use of cytolitic induction therapy reduced the risk of acute rejection by 32% (OR 0.68, 0.61–0.74), graft loss by 9% (HR 0.91, 0.86–0.97) and death by 12% (HR 0.88, 0.82–0.96). In particular, cytolitic induction substantially improved outcomes for those with clinically relevant modifiers, including public insurance, panel reactive antibody (PRA), delayed graft function (DGF), cold ischemic time (CIT), donor non-AA and steroid withdrawal (Figure).



CONCLUSIONS: These data make a strong case to standardize cytolitic induction therapy in AA kidney recipients as it reduces the risk of rejection, graft loss and death in adult AA KTX recipients, particularly in those that are sensitized (PRA > 20%), receive public insurance, develop DGF or undergo steroid withdrawal.

6

Axillary Dissection, Nodal Recurrence and Extent of RT in Z0011 Eligible Breast Cancer Patients: A Prospective Study

Monica Morrow, Kimberly Van Zee, Melissa Pilewskie,
Mahmoud El-Tamer, Andrea Barrio, George Plitas,
Lisa Scalfani, Laurie Kirstein, Sujata Patil, Hiram Cody, III
Memorial Sloan Kettering Cancer Center, New York, NY

OBJECTIVE(S): ACOSOG Z0011 established the safety of sentinel node biopsy (SLNB) alone in cT1-2N0 patients with 1–2 SLN+ undergoing breast conservation therapy (BCT), but concerns remain about patient selection and the role of RT. We prospectively assessed patterns of ALND and nodal recurrence in consecutive Z0011 eligible patients with known RT fields.

METHODS: From 9/2010 to 3/2016 723 patients met Z0011 criteria, had BCT and were SLN+; 125 (17%) had ALND (86 for ≥ 3 SLN+, 33 for extracapsular extension, 6 by surgeon choice) and 598 (83%) did not.

RESULTS: ALND was not more frequent in “high risk” (triple negative, HER2+, age <50) than non-high risk patients: 15.5% vs 15.9% ($p = 0.89$). Of 598 SLNB-only patients, 430 had followup ≥ 12 mo (median 33, range 12–68) and complete RT data. There were no isolated axillary failures and 5 coincident with breast or distant relapse. 5-year nodal recurrence-free survival was 98% and did not differ by RT fields (Table).

Table: Nodal Recurrence by Patient Characteristics and RT Fields

| | RT (n = 430) | | | p |
|---------------------|--------------|---------------|--------------|----------|
| | Prone Breast | Supine Breast | Breast+Nodes | |
| # pts (%) | 94 (22%) | 254 (59%) | 82 (19%) | |
| age (median) | 55 | 59 | 57 | .23 |
| pT size (cm) | 1.5 cm | 1.6 cm | 2.0 cm | .001 |
| # SLN+ (median) | 1 | 1 | 1 | .0003 |
| LVI % | 53 | 57 | 72 | .027 |
| ECE % | 17 | 28 | 52 | $<.0001$ |
| Stage > IIa | 27 | 31 | 48 | $<.0001$ |
| nodal relapse # (%) | 0 | 3 (1.2%) | 2 (2.4%) | .32 |

CONCLUSIONS: Most BCT patients with cT1-2N0 breast cancer and positive SLNs do not require ALND, and regional control is excellent with selective nodal RT. Our prospective data suggest that 1) wider acceptance of Z0011 will further decrease the morbidity of breast cancer surgery and 2) nodal RT for Z0011 patients need not be routine.

7

Improving Mortality and Decreasing VTE After Severe Traumatic Brain Injury: Low Molecular Weight Heparin Is Superior to Unfractionated Heparin

Elizabeth Benjamin, Gustavo Recinos, Alberto Aiolfi, Kenji Inaba, Demetrios Demetriades

USC Los Angeles County Medical Center, Los Angeles, CA

OBJECTIVE(S): Pharmacological venous thromboembolic (VTE) prophylaxis with Low Molecular Weight Heparin (LMWH) or Unfractionated Heparin (UH) is current standard of care in traumatic brain injuries (TBI). Experimental work shows heparinoids may have neuroprotective properties. Clinical work suggests LMWH may be more effective than UH for VTE prophylaxis in trauma patients. We hypothesized that LMWH is superior to UH in patients with severe isolated TBI.

METHODS: ACS TQIP database study including blunt severe TBI (AIS \geq 3), receiving LMWH or UH VTE prophylaxis. Patients with severe extracranial injuries (AIS \geq 3), mortality within 72 hours, or hospital stay <72 hrs were excluded. Demographic and physiologic data including age, gender, vital signs, GCS on admission, injury severity score (ISS), head, thorax and abdomen AIS, and timing of prophylaxis (within 48 hours, 49–72 hours and >72 hours) were collected. Outcomes included VTE complications, mortality, unplanned return to the operating room, ventilator days, ICU and hospital stay, and functional outcomes at discharge. Multivariate analysis was performed to compare outcomes between patients receiving LMWH and UH.

RESULTS: 20,417 patients met inclusion criteria for the study, 10018 (49.1%) received LMWH and 10399 (50.9%) UH. Multivariate analysis showed that LMWH was an independently protective against mortality and VTE complications, overall and in the subgroups of patients receiving prophylaxis within 48 hours, 49–72 hours and >72 hours. The type of prophylaxis had no effect on the need for unplanned return to the operating room.

CONCLUSIONS: LMWH prophylaxis in severe TBI is associated with better survival and lower VTE complications than UH.

8

Results of the First Prospective Multi-Institutional Treatment Study in Children with Bilateral Wilms Tumor (AREN0534) – A Report from the Children’s Oncology Group

Peter F. Ehrlich¹, Murali Chintagumpala², Yuen Chi³, Fred Hoffer⁴, Elizabeth Pearlman⁵, John Kalapurakal⁶, Anne Warwick⁷, Robert C. Shamberger⁸, Geetika Khanna⁹, Arnold Paulino¹⁰, Eric Gratiias¹¹, Elizabeth Mullen¹², James Geller¹³, Jeff Dome¹⁴, Michael Ritchey¹⁵

¹University of Michigan, Ann Arbor, MI; ²MD Anderson Baylor, Houston, TX; ³University of Florida, Gainesville, FL; ⁴University of Washington, Seattle, WA; ⁵Luire Childrens Hospital, Chicago, IL; ⁶Northwestern, Chicago, IL; ⁷Walter Reed Medical Center, Washinton, DC; ⁸Boston Childrens and Harvard University, Boston, MA; ⁹University of Washington at St. Louis, St. Louis, MO; ¹⁰MD Anderson, Houston, TX; ¹¹Childrens Oncology Group, Atlantata, GA; ¹²Dana Farber and Boston Childrens Hopsital, Boston, MA; ¹³University of Cincinnati, Cincinnati, OH; ¹⁴Children National Medical Center, Washington DC, DC; ¹⁵Phoenix Childrens Hosptial, Phoenix, AZ

OBJECTIVE(S): No prospective therapeutic clinic trials in children with bilateral Wilms tumors (BWT) exist. Historical outcomes for this group were poor and often involved prolonged chemotherapy; on NWT5-5, 4-year event-free-survival (EFS) and overall-survival (OS) were 61% and 80%. The Children’s Oncology Group (COG) study ARENO534 aimed to improve EFS and OS while preserving renal tissue by intensifying pre-operative chemotherapy completing definitive surgery by 12 weeks from diagnosis and modifying post-operative chemotherapy based on histologic response

METHODS: Patients were enrolled and imaging studies were centrally reviewed to assess for bilateral lesions. Patients with BWT were treated with 3-drug induction chemotherapy (vincristine, dactinomycin and doxorubicin) for 6 or 12 weeks based on radiographic response followed by surgery and further chemotherapy determined by histologic response. Radiation therapy was provided for post-chemotherapy stage III disease

RESULTS: 194/208 patients were evaluable. 4-year EFS and OS were 80.97% (95% CI: 70.98%–90.96%) and 94.16% (95% CI: 88.40%–99.92%). 25 patients relapsed and 7 had disease progression. After induction chemotherapy 163/194 (84.02%) underwent definitive surgical treatment in at least

one kidney by 12 weeks and 39% retained parts of both kidneys. Surgical approaches included: unilateral total nephrectomy with contralateral partial nephrectomy (48%), bilateral partial nephrectomy (35%), unilateral total nephrectomy (10.5%), unilateral partial nephrectomy (4%) and bilateral total nephrectomies (2.5%).

CONCLUSIONS: The AREN0534 treatment approach including standardized three-drug preoperative chemotherapy, surgical resection within 12 weeks of diagnosis and response-based post-operative therapy improved EFS and OS and preservation of renal parenchyma compared to historical outcomes for children with BWT.

9

Intraoperative Molecular Imaging Is Superior to Positron Emission Tomography for Identifying Malignant Pulmonary Nodules

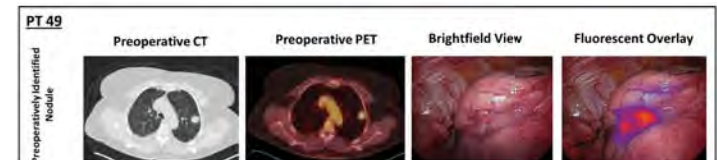
Jarrod D. Predina¹, Andrew Newton¹, Jane Keating¹, Olugbenga Okusanya², Jeffrey Drebin¹, Sunil Singhal¹

¹University of Pennsylvania School of Medicine, Philadelphia, PA; ²University of Pittsburgh Medical Center, Pittsburgh, PA

OBJECTIVE(S): PET is commonly utilized in preoperative assessment of patients with pulmonary nodules; however, sensitivity can be limited. We hypothesize that intraoperative molecular imaging (IMI) with the folate receptor targeted near-infrared agent (OTL0038) is more sensitive than PET for identifying malignant pulmonary nodules.

METHODS: Fifty patients with CT confirmed pulmonary nodules underwent preoperative PET. Patients then received OTL0038 prior to pulmonary resection. During resection, IMI was utilized to image known lung nodules and identify synchronous lesions. Mean size, standardized uptake value (SUV), and tumor-to-background fluorescence ratio (TBR) were compared for known and synchronous nodules by paired t-tests.

RESULTS: IMI identified 49/50 (98%) known pulmonary nodules. In 10 patients, IMI identified 11 additional lesions not described by PET. Nodules detected only by IMI were smaller than preoperatively identified nodules (0.5 cm vs 2.4 cm; $p = 0.022$) and had lower SUVs (1.0 vs 4.3; $p = 0.013$). TBR was similar among nodules only identified by IMI versus those identified preoperatively (3.1 and 3.2; $p > 0.05$). Sensitivity of IMI versus PET was 98.2% versus 69.5% ($p < 0.001$); positive-predictive values were 90.1% versus 89.6% ($p > 0.05$).



CONCLUSIONS: These data suggest that intraoperative molecular imaging is more sensitive than PET in identifying malignant pulmonary nodules. Utilizing intraoperative imaging as an adjunct to standard imaging may provide superior oncologic outcomes. These data are the basis of the first phase II clinical trial of intraoperative tumor imaging in the United States.

10**Laparoscopic Surgery for Small Bowel Obstruction Is Associated with a Higher Risk of Bowel Injury: A Population-Based Analysis of 8,584 Consecutive Patients**

Ramy Behman, Avery B. Nathens, James Byrne, Stephanie Mason, Nicole Look Hong, Paul J. Karanicolas
University of Toronto, Toronto, ON, Canada

OBJECTIVE: Laparoscopic lysis of adhesions for small bowel obstruction (SBO) is becoming more common yet might increase the risk of bowel injury given the distended and/or potentially compromised small bowel. We set out to compare the incidence of bowel repair and/or resection in a large cohort of patients with adhesive SBO (aSBO) managed operatively.

METHODS: We used administrative discharge data derived from a large geographic region, identifying patients who underwent surgery for their first episode of aSBO over 2005–14. Procedure codes were used to determine the exposure: either an open approach or a laparoscopic approach (including procedures converted to open). The primary outcome was incidence of bowel intervention, defined as intraoperative enterotomy, suture repair of intestine, or bowel resection. We estimated the odds of bowel intervention after adjusting for patient and clinical factors, including time-to-operation.

RESULTS: 8,584 patients underwent operation for aSBO. Patients undergoing laparoscopic procedures were younger with fewer comorbid conditions. Laparoscopic approaches increased more than 3-fold over the study period (4.3% to 14.3%, $p < 0.0001$). The incidence of bowel intervention was 53.5% vs 43.4% in laparoscopic vs open procedures ($p < 0.0001$). After adjustment for potential confounders, the odds of bowel intervention among patients treated laparoscopically versus open was 1.6 (95% CI: 1.4–1.9).

CONCLUSIONS: Laparoscopic procedures for aSBO are associated with a greater likelihood of need for intervention for bowel injury and/or repair. This increase might be due to challenges inherent with laparoscopic approaches in patients with distended small bowel. Laparoscopic approaches in this patient population should be accompanied by considerable caution.

11**Who Makes It to the End? A Novel Predictive Model for Identifying Surgical Residents at Risk of Dropping Out**

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¹New York Presbyterian Hospital – Weill Cornell Medicine, New York, NY; ²American Board of Surgery, Philadelphia, PA; ³Lewis Katz School of Medicine, Temple University, Philadelphia, PA; ⁴Duke University Medical Center, Durham, NC

OBJECTIVE(S): Attrition in graduate surgical education is 15–35% despite ACGME work-hour reforms. No prospective nationwide study has evaluated factors contributing to trainee loss.

METHODS: This is a nationwide 8-year prospective cohort study of general surgery interns from the Class of 2007. Initial survey results were linked with ABS data (ABSITE dates/scores, residency completion, board status, and program characteristics). Non-parametric classification and regression tree (CART) analysis identified risk factors at the resident level for training non-completion using successive binary divergences of covariates.

RESULTS: There were 1048 interns in 2007. Matched data were available for 80%, representing 83% of residencies. 788 (94%) residents had ≥ 1 ABSITE, and 672 (80%) completed training. Gender was the most important predictor of attrition; drop-out for men was 17% vs. 24% for women. For men, the next most important predictor was program size; larger programs had higher drop-out (23% vs. 17% smaller programs). Lowest drop-out was among non-Hispanic married white men at smaller non-academic programs outside the northeast (<6%). Among women, the most important factor was race, with 30% of non-white women leaving vs. 20% for whites. For non-white women, attrition was highest at academic programs (35% vs. 30% non-academic). White women at large academic programs experienced higher drop-out (25% vs 11% smaller programs). Lowest drop-out was among white women at small community programs with a relative in medicine (5%).

CONCLUSIONS: We evaluated attrition in the first longitudinal national cohort study using an individualized predictive model that allows identification of residents at risk and creates a framework for interventions.

12**Trending Fibrinolytic Dysregulation: Changes in Fibrinolysis over Hospitalization Predict Poor Outcome in Severely-injured Children**

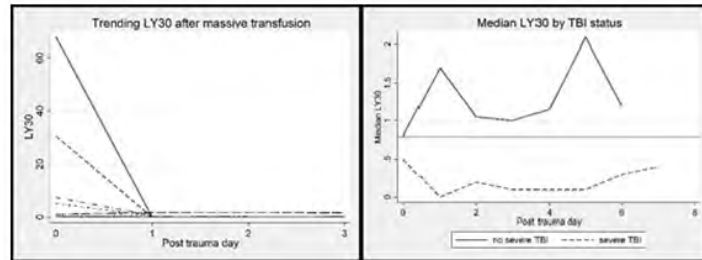
Christine Leeper, Matthew D. Neal, Christine McKenna, Barbara Gaines

Children's Hospital of Pittsburgh of UPMC, Pittsburgh, PA

OBJECTIVE(S): Fibrinolytic derangement at the time of admission after trauma is common in severely-injured children; no studies examine fibrinolysis status days after injury. Objectives were to trend fibrinolysis and determine the influence of traumatic brain injury (TBI) and massive transfusion on fibrinolysis status.

METHODS: Prospective study of severely-injured children at our academic level 1 pediatric trauma center. Rapid thromboelastography (TEG) was obtained on admission and daily for 1 week. Standard TEG definitions of hyperfibrinolysis (HF; LY30 ≥ 3), fibrinolysis shutdown (SD; LY30 ≤ 0.8), and normal (LY30 = 0.9–2.9) were applied. Tranexamic acid (TXA) use was documented. Outcomes were death, disability, and venous thromboembolism. Exploratory subgroups included massively-transfused and severe TBI patients.

RESULTS: 67 patients were analyzed with median (IQR) age = 9 (4.5–12.5) and ISS = 22 (13–34), 75% blunt mechanism, 40% severe TBI, 24% massively transfused. Outcomes were 15% mortality, 40% disability and 14% DVT. Remaining in or trending to SD was associated with death ($p = 0.033$), disability ($p = 0.042$) and DVT ($p = 0.011$). Hyperfibrinolysis without associated shutdown was not related to poor outcome. The majority (56%) of massively-transfused patients in hemorrhagic shock were in SD on admission. All with HF (25%) corrected after hemostatic resuscitation without TXA. Severe TBI was associated with SD at all time points beyond admission (all $p < 0.05$).



CONCLUSIONS: Fibrinolysis shutdown is common post-injury and predicts poor outcomes. Severe TBI is associated with sustained shutdown. Empiric antifibrinolytics for children should be questioned; TEG-directed selective use should be considered for patients with ongoing hyperfibrinolysis.

13

The 5th Vital Sign: Postoperative Pain Predicts 30-Day Readmission and Emergency Department Visits

Mary T. Hawn¹, Laura Graham², Tyler Wahl², Elise Aucoin², Karishma Desai¹, Melanie Morris², Kamal Itani³, Gordon Telford⁴, Joshua Richman⁵, Tina Hernandez-Boussard¹

¹Stanford University, Stanford, CA; ²University of Alabama at Birmingham, Birmingham, AL; ³Boston VAMC, Boston, MA; ⁴Medical College of Wisconsin, Milwaukee, WI; ⁵University of Alabama at Birmingham, Birmingham, AL

OBJECTIVES: Surgical readmissions have few known modifiable predictors. We hypothesized that inpatient postoperative pain trajectories are associated with 30-day inpatient readmission and emergency department (ED) visits.

METHODS: National VASQIP data on inpatient general, vascular, and orthopedic surgery from 2008–2014 were merged with laboratory, vital sign, healthcare utilization, and postoperative complications data. Six distinct postoperative inpatient pain trajectories were identified: (1) persistently low, (2) mild to low, (3) persistently mild (4) moderate to low, (5) persistently moderate or (6) persistently high based on postoperative pain scores. Regression models estimated the association between pain trajectories and post-discharge utilization while controlling for important patient and clinical variables.

RESULTS: Our sample included 211, 213 surgeries: 45% orthopedics, 37% general, and 18% vascular. Overall, the 30-day unplanned readmission rate was 10.8% and 30-day ED utilization rate was 14.2%. Patients in the high pain trajectories had the highest rates of post-discharge readmissions and ED visits (14.4% and 16.3%, respectively, $p < 0.001$). In multivariable models, compared to the persistently low pain trajectory, there was a dose dependent increase in post-discharge ED visits and readmission for pain-related diagnoses (X^2 trend $p < 0.001$) (Figure).

MISSING FIGURE

CONCLUSIONS: Postoperative pain trajectories identify populations at risk for 30-day readmissions and ED visits and does not appear to be mediated by post-discharge complications. Addressing pain control expectations prior to discharge may help reduce surgical readmissions in high pain categories.

FRIDAY MORNING, APRIL 21st**6:30 AM – 8:00 AM****ASA WOMEN IN SURGERY BREAKFAST
Franklin 13****8:00 AM – 10:30 AM
Grand Ballroom Salons A - F****SCIENTIFIC SESSION III***Moderator: Keith D. Lillemoe, M.D.***14****Impact of Pretransplant Bridging Locoregional Therapy for Patients with Hepatocellular Carcinoma within Milan Criteria Undergoing Liver Transplantation: Analysis of 3601 Patients from the US Multicenter HCC Transplant Consortium**

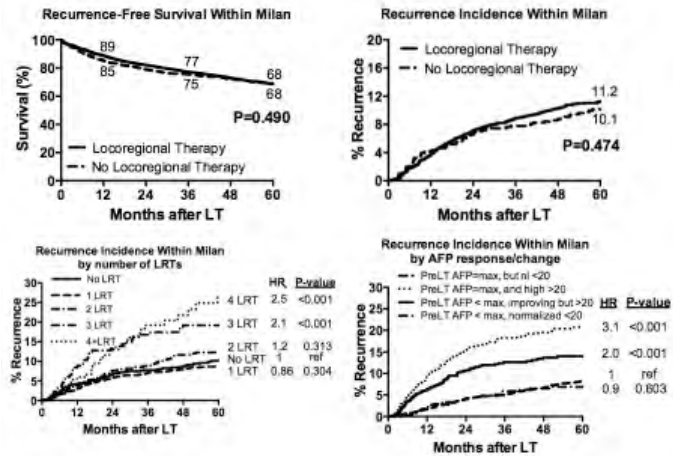
Vatche G. Agopian¹, Michael P. Harlander-Locke¹, Richard M. Ruiz², Goran B. Klintmalm², Sander S. Florman³, Brandy Haydel³, Maarouf Hoteit⁴, David D. Lee⁵, C. Burcin Taner⁵, Elizabeth C. Verna⁶, Karim J. Halazun⁷, Amit D. Tevar⁸, Federico Aucejo⁹, William C. Chapman¹⁰, Neeta Vachharajani¹⁰, Marc L. Melcher¹¹, Mindie H. Nguyen¹¹, Trevor L. Nydam¹², Constance Mobley¹³, Mark R. Ghobrial¹³, Beth M. Amundsen¹⁴, James F. Markmann¹⁴, Alan N. Langnas¹⁵, Carol A. Carney¹⁵, Jennifer Berumen¹⁶, Alan W. Hemming¹⁶, Debra L. Sudan¹⁷, Johnny C. Hong¹⁸, Joohyun Kim¹⁸, Michael A. Zimmerman¹⁸, Abbas Rana¹⁹, Michael L. Kueht¹⁹, Christopher M. Jones²⁰, Thomas M. Fishbein^{*21}, Ronald W. Busuttil¹

*By invitation

¹Dumont UCLA Transplant Center, University of California, Los Angeles, Los Angeles, CA; ²Annette C. and Harold C. Simmons Transplant Institute, Baylor University Medical Center, Dallas, TX; ³Icahn School of Medicine at Mount Sinai, New York, NY; ⁴Penn Transplant Institute, University of Pennsylvania School of Medicine, Philadelphia, PA; ⁵Department of Transplantation, Mayo Clinic, Jacksonville, FL; ⁶New York Presbyterian Hospital, Columbia University Medical Center, New York, NY; ⁷New York Presbyterian Hospital, Weill Cornell Medical Center, New York, NY; ⁸Thomas E. Starzl Transplantation Institute, University of Pittsburgh Medical Center, Pittsburgh, PA; ⁹Cleveland Clinic Foundation, Cleveland, OH; ¹⁰Washington University School of Medicine, St. Louis, MO; ¹¹Stanford University Medical Center, Palo Alto, CA; ¹²Division of Transplant, University of Colorado School of Medicine, Denver, CO; ¹³Houston Methodist Hospital, Houston, TX; ¹⁴Division of Transplant Surgery, Massachusetts General Hospital, Harvard Medical School, Boston, MA; ¹⁵Section of Transplantation, University of Nebraska Medical Center, Omaha, NE; ¹⁶Division of Transplantation, Department of Surgery, University of California, San Diego, San Diego, CA; ¹⁷Division of Abdominal Transplant Surgery, Department of Surgery, Duke University Medical Center, Durham, NC; ¹⁸Division of Transplant Surgery, Department of Surgery, Medical College of Wisconsin, Milwaukee, WI; ¹⁹Division of Abdominal Transplantation, Baylor College of Medicine, Houston, TX; ²⁰Division of Transplant Surgery, Department of Surgery, University of Louisville School of Medicine, Louisville, KY; ²¹Medstar Georgetown Transplant Institute, Georgetown University, Washington, DC

OBJECTIVE(S): Pretransplant locoregional therapy (LRT) mitigates tumor progression and waitlist dropout in hepatocellular carcinoma (HCC) patients within Milan Criteria (MC) listed for liver transplantation (LT). We sought to evaluate the effect of LRT on post-LT recurrence and survival, where data remains limited.

METHODS: Recurrence-free survival and post-LT recurrence were compared among MC patients with and without bridging LRT utilizing competing risk Cox-regression in consecutive patients from 20 US centers (2002–2013).



RESULTS: Of 3601 MC LT recipients, 2854 receiving LRT (79.3%) had similar 1-, 3-, and 5-year recurrence-free survival and post-LT recurrence compared to the 747 (20.7%) without LRT, with increasing treatment number and unfavorable waitlist alphafetoprotein (AFP) trend significantly predicting post-LT recurrence (Figure). Treated patients achieving complete pathologic response (cPR) (n = 702, 19.5%) had significantly lower post-LT recurrence compared to patients without cPR (n = 2082, 57.8%; 5.3% vs 13.1%, P < 0.001). In multivariable analysis controlling for pre-LT variables, LRT number but not modality significantly affected post-LT recurrence (Table).

Table: Multivariate Analysis of LRT Number and Modality on Post-LT Recurrence Controlling for AFP and NLR

| Controlled Variable Kept Constant | Variable | Hazard Ratio | 95% CI | P-Value |
|-----------------------------------|-------------|--------------|-----------|---------|
| TACE | 2LRT vs 1 | 1.46 | 0.99–2.13 | 0.053 |
| | 3+ LRT vs 1 | 2.58 | 1.75–3.79 | <0.001 |
| Ablation | 2 LRT vs 1 | 0.89 | 0.3–2.59 | 0.826 |
| | 3+ LRT vs 1 | 5.6 | 2.3–13.5 | <0.001 |

| Controlled Variable Kept Constant | Variable | Hazard Ratio | 95% CI | P-Value |
|-----------------------------------|-----------------------|--------------|-----------|---------|
| TACE and Ablation | 3+ LRT vs 2 | 1.97 | 0.97–4.00 | 0.060 |
| 1 Treatment | Ablation vs TACE | 1.05 | 0.67–1.64 | 0.833 |
| | Ablation+TACE vs TACE | 0.84 | 0.44–1.59 | 0.587 |
| 2 Treatments | Ablation vs TACE | 0.64 | 0.22–1.82 | 0.401 |
| | Ablation+TACE vs TACE | 0.84 | 0.44–1.59 | 0.587 |
| 3+ Treatments | Ablation vs TACE | 2.28 | 0.97–5.36 | 0.059 |

CONCLUSIONS: Bridging LRT in HCC patients within MC does not improve post-LT survival or HCC recurrence in the majority of patients who fail to achieve cPR. The need for increasing LRT treatments and lack of AFP response to LRT predict post-LT recurrence, and serve as a surrogate for more aggressive tumor biology.

15**Should Patients with Cystic Lesions of the Pancreas Undergo Long-Term Radiographic Surveillance?****Results of 3,024 Patients Evaluated at a Single Institution**

Sharon A. Lawrence, Marc A. Attiyeh, Kenneth Seier, Mithat Gonen, Vinod Balachandran, T. Peter Kingham, Michael I. D'Angelica, Ronald DeMatteo, Murray F. Brennan, William R. Jarnagin, Peter J. Allen

Memorial Sloan Kettering Cancer Center, New York, NY

OBJECTIVE: In 2015, the American Gastroenterological Association recommended discontinuing radiographic surveillance after five years in patients with stable cysts. This study evaluated the yield of continued surveillance of pancreatic cysts after five years of follow-up.

METHODS: A prospectively maintained registry of patients evaluated for pancreatic cysts was queried (1995–2016). Patients initially followed were divided into those with <5 yrs and ≥5 yrs of follow-up. Analyses for the presence of cyst growth (>5 mm increase in diameter), cross-over to resection, and development of carcinoma were performed.

RESULTS: A total of 3,024 patients were identified, with 2,472 undergoing initial surveillance. The ≥5 yrs group (n = 596) experienced a greater frequency of cyst growth (44% vs 20%; p < 0.0001), a lower rate of cross-over to resection (8% vs 11%; p = 0.02), and a similar frequency of progression to carcinoma (2% vs 3%; p = 0.07) compared to the <5 yrs group (n = 1876). Within the ≥5 yrs group, 414 patients (69%) demonstrated radiographic stability at the five-year time point. This subgroup, when compared to the <5 yr group, experienced similar rates of cyst growth (19% vs 20%; p = 0.89) and lower rates of cross-over to resection (5% vs 11%; p < 0.0001) and development of carcinoma (1% vs 3%; p = 0.0084). The observed-to-expected ratio for developing carcinoma in those radiographically stable at 5yrs was 31.3 per 100,000 per year, compared to 12.4 per 100,000 per year in the general population as per SEER.

CONCLUSION: Cyst size stability at the five-year time point did not preclude future growth, cross-over to resection, or carcinoma development. Patients who were stable at five years had a 3-fold higher risk of developing cancer compared to the general population and should continue long-term surveillance.

16**A Randomized Controlled Trial of Postoperative Thoracic Epidural Analgesia Versus Intravenous Patient Controlled Analgesia After Major Hepatopancreatobiliary Surgery**

Thomas A. Aloia*¹, Bradford J. Kim¹, Yun Shin Chun*¹, Juan P. Cata*¹, Mark J. Truty*², Alexander Holmes*¹, Jose M. Soliz*¹, Keyuri U. Popat*¹, Debra L. Kennamer*¹, Thomas F. Rahlfs*¹, Jeffrey E. Lee¹, Vijaya Gottumukkala*¹, Jean-Nicolas Vauthey¹

¹*University of Texas MD Anderson Cancer Center, Houston, TX;*

²*Mayo Clinic, Rochester, MN*

OBJECTIVE(S): The optimal postoperative analgesic regimen for hepatopancreatobiliary (HPB) surgery patients remains controversial. The primary objective of this single-center randomized trial was to compare thoracic epidural analgesia (TEA) to intravenous patient controlled analgesia (PCA) for adequacy of pain control over the first 48 hours after surgery. Secondary endpoints were anesthetic and surgical complications.

METHODS: Using a 2.5:1 randomization strategy, 140 patients undergoing HPB resections were randomized to TEA (N = 106) or PCA (N = 34). Patient-reported pain was measured on a Likert scale (0–10) at standard time intervals. Cumulative pain area under the curve (AUC) was determined using the trapezoidal method.

RESULTS: Demographic, comorbidity, clinical and operative variables, including incision type and resection magnitude were equivalent. Likewise, estimated blood loss, operative time, and postoperative drain placement were similar. The median AUC of the postoperative time 0 to 48 hour pain scores was significantly lower in the TEA group (81.15 vs 109.6, p = 0.029) with a 35% reduction in patients with pain episodes >= 7/10 (43% vs 66%, p = 0.05). Anesthesia related events requiring change in analgesic therapy were comparable (10.4% vs 3.1%, p = 0.29). Grade >= 3 surgical complications occurred in 7 TEA group patients (6.6%) and 3 PCA group patients (9.4%, p = 0.7). Median length of stay (6 days vs 6 days), readmission (1.9% vs 3.1%), and return to the OR (0.9 vs 3.1%) were similar (all p > 0.05). There were no mortalities in either group.

CONCLUSIONS: In major HPB surgery, TEA provides a superior patient experience through improved pain control without increased length of stay or complications.

*By invitation

17

Wide Variation and Over-Prescription of Opioids Following Elective Surgery

Cornelius A. Thiels¹, Stephanie S. Anderson¹, Daniel S. Ubl¹, Kristine T. Hanson¹, Whitney J. Bergquist¹, Richard J. Gray², Halena M. Gazelka¹, Robert R. Cima¹, Elizabeth B. Habermann¹

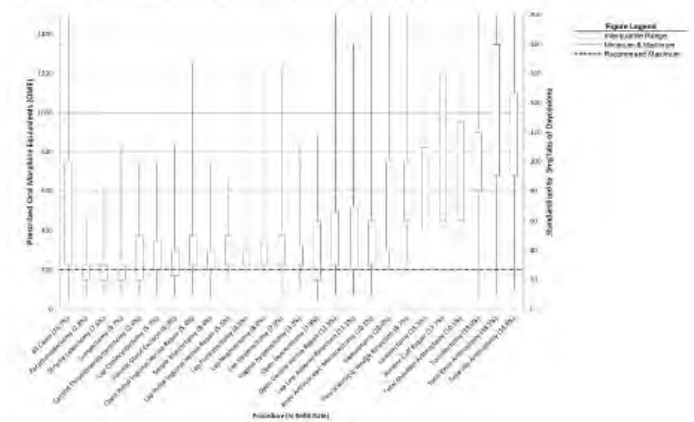
¹Mayo Clinic, Rochester, MN; ²Mayo Clinic, Scottsdale, AZ

OBJECTIVE(S): In an effort to minimize the contribution of prescription narcotics to the nationwide opioid epidemic, postoperative opioid prescribing guidelines have been developed. Minnesota recommends a maximum of 200 mg oral morphine equivalents (OME) for postoperative pain in opioid naïve patients. We aimed to identify opioid prescribing practices across specialties and institutions.

METHODS: Adults undergoing 25 common elective procedures 2013–2015 were identified from National Surgical Quality Improvement Program data from three academic centers in Minnesota, Arizona, and Florida. Opioids prescribed at discharge were abstracted from pharmacy data and converted into OME. Wilcoxon Rank-Sum and Kruskal-Wallis tests assessed variations.

RESULTS: Of 7651 patients, 94.3% received opioid prescriptions at discharge. Of 7217 patients who received opioid prescriptions, a median of 450 OME (IQR 225–850) were prescribed. Median OME varied by sex (420 male vs 450 female, $p = 0.005$) and increased with age (395 age 18–39 to 525 age 80+, $p < 0.001$). Obese patients and patients with non-cancer diagnoses received more opioids (both $p < 0.001$). No difference was seen across race, between readmitted patients, or those who experienced complications (all $p > 0.05$). Subset analysis of the 5756 (75.2%) opioid naïve patients showed the majority received >200 OME (81.5%), which varied across procedures (Figure).

Figure: Post-discharge opioid prescription practices in opioid naïve patients across 25 common elective surgical procedures.



CONCLUSIONS: The majority of patients were over-prescribed opioids. Significant prescribing variation exists that was not explained by patient factors. These data will guide practices to optimize opioid prescribing after surgery.

18

Minimally Invasive Proctectomy Is Associated with Reduced Margin Positivity and Improved Survival in Patients with Locally Advanced Rectal Cancer

Sarath Sujatha-Bhaskar, Mehraneh D. Jafari, John V. Gahagan, Steven Mills*, Joseph C. Carmichael*, Michael J. Stamos, Alessio Pigazzi*

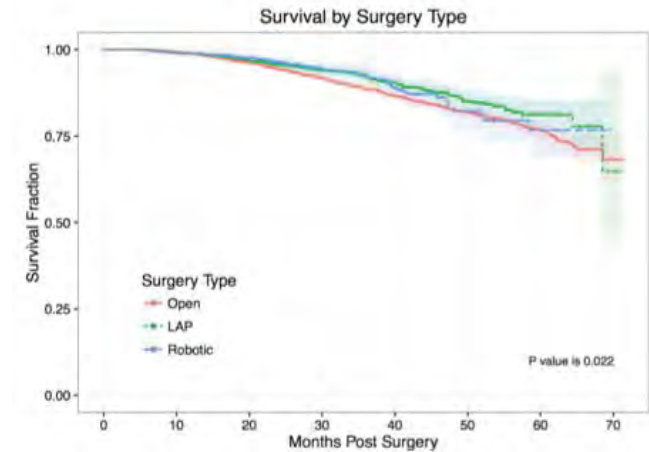
University of California, Irvine School of Medicine, Orange, CA

OBJECTIVE(S): Surgical management for rectal adenocarcinoma is evolving towards utilization of minimally invasive (MIS) techniques. The oncological impacts of an MIS approach to rectal cancer have yet to be defined. We aim to examine the oncological outcomes of minimally invasive proctectomy.

METHODS: Retrospective review of the National Cancer Database identified patients with non-metastatic rectal adenocarcinoma from 2010–2014 who underwent neoadjuvant chemoradiation, surgical resection, and adjuvant therapy. Cases were stratified by surgical approach (open, laparoscopic or robotic). Multivariate analysis was used to compare perioperative outcomes. Cox proportional hazard modeling estimated long-term all-cause survival.

RESULTS: Of 5,830 cases of rectal adenocarcinoma, 3,311 (56%) underwent open proctectomy (OP), 1,695 (29%) underwent laparoscopic proctectomy (LP), and 824 (14%) underwent robotic proctectomy (RP). Compared with open resection, RP (OR 1.99, 95% CI 1.35–2.93, $p < 0.05$) and LP (1.60, 1.22–2.10, $p < 0.05$) offered higher rates of overall negative margins. RP (1.81, 1.23–2.66, $p < 0.05$) and LP (1.79, 1.34–2.40, $p < 0.05$) yielded superior negative circumferential margin rates compared to OP. RP and LP were equivalent with respect to margin positivity. LP (0.80, 0.65–0.98, $p < 0.05$) revealed lower 5-year death hazard rates than OP. RP and LP demonstrated similar death rates.

*By invitation



CONCLUSIONS: While open proctectomy remains the predominant technique for surgical resection of rectal adenocarcinoma, robotic and laparoscopic approaches are associated with reduced margin positivity and improved overall survival.

19

Readiness of US General Surgery Residents for Independent Practice

Brian George¹, Jordan Bohnen², Reed Williams³, Shari Meyerson⁴, Mary Schuller⁴, Andreas Meier^{*5}, Laura Torbeck³, Samuel Mandell⁶, John Mullen^{*2}, Douglas Smink^{*7}, Jeffrey Chipman^{*8}, Edward Auyan⁹, Kyla Terhune^{*10}, Paul Wise^{*11}, Jennifer Choi^{*3}, Eugene Foley¹², Justin Dimick¹, Michael Choti¹³, Nathaniel Soper⁴, Keith Lillemoe², Joseph Zwischenberger¹⁴, Gary Dunnington³, Debra DaRosa⁴, Jonathan Fryer⁴

¹University of Michigan, Ann Arbor, MI; ²Massachusetts General Hospital, Boston, MA; ³Indiana University, Indianapolis, IN; ⁴Northwestern University, Chicago, IL; ⁵SUNY Upstate, Syracuse, NY; ⁶University of Washington, Seattle, WA; ⁷Brigham and Women's Hospital, Boston, MA; ⁸University of Minnesota, Minneapolis, MN; ⁹University of New Mexico, Albuquerque, NM; ¹⁰Vanderbilt University, Nashville, TN; ¹¹Washington University, Saint Louis, MO; ¹²University of Washington, Madison, WI; ¹³University of Texas Southwestern, Dallas, TX; ¹⁴University of Kentucky, Lexington, KY

OBJECTIVE: The American Board of Surgery has designated 133 procedures as being “Core” to the practice of General Surgery (GS). GS residents are expected to be able to safely and independently perform those procedures by the time they graduate. There is growing concern that not all residents achieve that standard.

METHODS: Attendings in 14 General Surgery programs were trained to use a) the 5-level SIMPL Performance scale to assess resident readiness for independent practice and b) the 4-level Zwisch scale to assess the level of guidance (i.e. autonomy) they provided to residents during specific procedures. Ratings were collected immediately after cases that involved a categorical GS resident. Data were analyzed using descriptive statistics.

RESULTS: 368 attending surgeons rated 393 categorical residents after 5861 procedures. The five most frequently rated Core procedures were laparoscopic cholecystectomy, laparoscopic appendectomy, open inguinal hernia repair, open ventral hernia repair, and exploratory laparotomy. From the first to the last year of training, the proportion of Performance ratings at “Practice Ready” or above for the top five Core procedures (n = 1541)

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increased from 11.8% to 90.0% (p < 0.001, 95% CI 7.4–18.1% and 86.2–92.9%, respectively) (Figure 1). For the most frequently rated procedure for residents in their final six months of training (laparoscopic cholecystectomy), the proportion of Performance ratings (n = 161) at “Practice Ready” or above was 87.0% (95% CI 80.5–91.1%). For all procedures (n = 5861), the proportion of Zwisch ratings indicating meaningful autonomy (“Passive Help” or “Supervision Only”) increased from 16.9% to 67.0% (p < 0.001, 95% CI 14.4–19.7% and 64.4–69.5%, respectively) from the first to the last year of training. For the five most frequently rated Core procedures performed by residents in their final 6 months of training (n = 342), the proportion of Zwisch ratings indicating near-independence (“Supervision Only”) was 49.1% (n = 342, 95% CI 43.7–54.5%) (Figure 2).

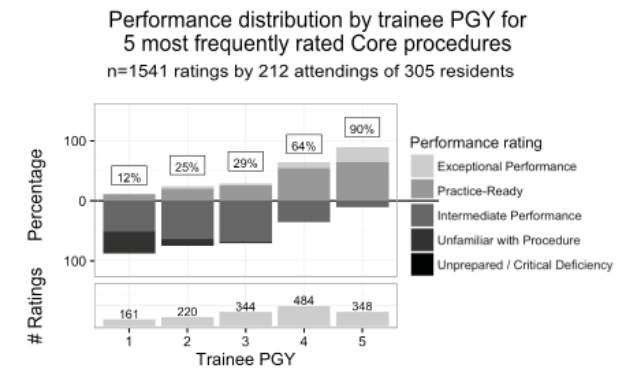


Figure 1: The relationship between resident post-graduate year (PGY) and the distribution of operative Performance ratings. Ratings indicating readiness for independent practice (Practice-Ready and Exceptional Performance) are plotted above the line in the top panel, with the percentage of ratings in those two top categories above each bar. The total number of ratings for each PGY is shown in the histogram below each distribution.

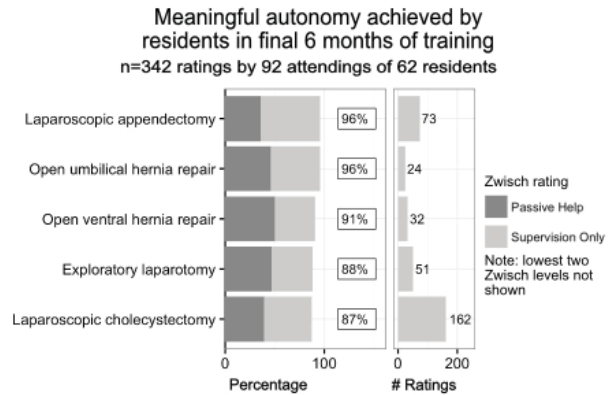


Figure 2: The distribution of faculty guidance (Zwisch) ratings for trainees in the last 6 months of their residency training while performing one of the five most frequently rated American Board of Surgery-defined “Core” procedures. Ratings indicating meaningful autonomy (Passive Help and Supervision Only) are plotted in the left panel. The total number of ratings for each procedure is shown in the histogram in the right panel.

CONCLUSIONS: US General Surgery residents are generally but not universally ready to independently perform the most common Core procedures by the time they complete residency training. Resident autonomy is also limited. It is unknown if the amount of autonomy residents do achieve is sufficient to ensure readiness for independent practice.

FRIDAY MORNING, APRIL 21st, CONTINUED

10:30 AM – 12:00 PM
Grand Ballroom Salons A - F

FORUM DISCUSSION

A Lifetime of Surgical Education: Can We Do Better?

Moderator: Keith D. Lillemo, M.D.

Training in Surgery: Identifying, Preparing, and Providing the Optimal Experience for Our Residents

Mary E. Klingensmith, M.D.

Washington University School of Medicine, St. Louis, MO

“Practice Ready”: Competency Assessment of the Finishing Surgical Resident

Ara Darzi, M.D.

Imperial College London, London, United Kingdom

Maintenance of Certification: The Reality of Sustaining Competency

Spence M. Taylor, M.D.

USC School of Medicine Greenville, Greenville, SC

FRIDAY AFTERNOON, APRIL 21st

1:30 PM – 4:00 PM
Grand Ballroom Salons A - F

SCIENTIFIC SESSION IV

Moderator: Theodore N. Pappas, M.D.

20

Multicenter Randomized Prospective Trial of Blood Transfusion in Major Burn Injury

Tina L. Palmieri¹, James Holmes², Brett Arnoldo³, Michael Peck⁴, Bruce Potenza^{*5}, Amalia Cochran^{*6}, Booker King⁷, William Dominick^{*8}, Robert Cartotto^{*9}, Dhaval Havsar^{*10}, Nathan Kemalyan^{*11}, Edward Tredget¹², Francois Stapelberg¹³, David Mozingo^{*14}, David G. Greenhalgh¹, Bradley Pollock¹⁵

¹University of California Davis and Shriners Hospital for Children Northern California, Sacramento, CA; ²Wake Forest Baptist Health, Winston-Salem, NC; ³University of Texas Southwestern Medical Center, Dallas, TX; ⁴The Arizona Burn Center, Maricopa Medical Center, Phoenix, AZ; ⁵University of California San Diego, San Diego, CA; ⁶University of Utah Department of Surgery, Salt Lake City, UT; ⁷Institute of Surgical Research, San Antonio, TX; ⁸Community Regional Medical Center, Fresno, CA; ⁹Sunnybrook Health Sciences Centre, Toronto, ON, Canada; ¹⁰Kansas University Medical Center, Kansas City, KS; ¹¹Oregon Burn Center, Portland, OR; ¹²University of Alberta, Edmonton, AB, Canada; ¹³New Zealand National Burn Centre, Middlemore Hospital, Middlemore, New Zealand; ¹⁴University of Florida Health Science Center, Gainesville, FL; ¹⁵University of California Davis, Sacramento, CA

OBJECTIVE: Studies suggest superiority of a restrictive transfusion policy in stable critically ill patients. These studies excluded surgical patients with significant blood loss. Our objective was to compare outcomes of a restrictive red-cell transfusion strategy to a liberal strategy in $\geq 20\%$ total

*By invitation

body surface area (TBSA) burn patients. We hypothesized that the restrictive group would have less blood stream infections, organ dysfunction, and mortality.

METHODS: Patients were block randomized by age and TBSA to a restrictive (maintaining hemoglobin 7–8g/dl) or liberal (maintaining hemoglobin 10–11g/dl) strategy throughout hospitalization, including surgery. Data collected included demographics, infections, transfusions, and outcomes.

Table: Means \pm SD or Percentage (n) of Selected Variables for Each Treatment Group

| Variable | Liberal (n = 177) | Restrictive (n = 168) |
|-----------------------|-------------------|-----------------------|
| Age (years) | 43.8 \pm 17 | 42.1 \pm 16.7 |
| Gender (% male) | 78.5% (n = 139) | 79.8% (n = 134) |
| TBSA (%) | 39.1 \pm 18.5 | 37 \pm 16.6 |
| Inhalation Injury (%) | 20.9% (n = 37) | 24.4% (n = 41) |
| Mortality (%) | 11.3% (n = 20) | 13.7% (n = 23) |
| Ventilator Days | 18.9 \pm 36.7 | 17.3 \pm 25 |
| Days to Wound Healing | 36.4 \pm 39.5 | 39.2 \pm 50.5 |
| BSI* (Y/N) | 23.7% (n = 42) | 23.8% (n = 40) |
| Number of BSI | 0.5 \pm 1.4 | 0.4 \pm 0.9 |
| Worst MOD** score | 7.03 \pm 4.31 | 7.60 \pm 4.36 |

*BSI = blood stream infection; **MOD = multiple organ dysfunction score

RESULTS: Eighteen burn centers enrolled 345 patients with $\geq 20\%$ TBSA burn. A total of 7,054 units blood were transfused. Patients were similar in age, TBSA burn, and inhalation injury. (Table) The restrictive group received less blood: 31.8 \pm 44.3 (mean \pm sd), Median = 16 [IQR: 7, 40] vs. 20.3 \pm 32.7, Median = 8 [IQR: 3, 24] units, respectively ($p < 0.0001$, Wilcoxon rank sum). There were no significant differences in 30-day mortality: 8.5% liberal vs. 9.5% restrictive ($p = 0.892$, test of proportions), or in actuarial survival ($p = 0.555$, log-rank). Similarly, blood stream infection (BSI) incidence, ventilator days, time to wound healing, and organ dysfunction were similar across groups ($p > 0.05$).

CONCLUSIONS: A restrictive transfusion strategy reduced blood utilization but did not decrease blood stream infection, mortality, or organ dysfunction in major burn injury.

21**Is Annual Surgical Volume Enough? The Role of Experience and Specialization on Inpatient Mortality Following Hepatectomy**

Daniel A. Hashimoto, Yanik J. Bababekov, Sahael M. Stapleton, Keith D. Lillemoe, David C. Chang, Parsia A. Vagefi
Massachusetts General Hospital, Boston, MA

OBJECTIVE(S): The impact of annual surgical volume on post-operative outcomes has been extensively examined. However, the impact of cumulative surgeon experience and specialty training on this relationship warrants investigation.

METHODS: The New York Statewide Planning and Research Cooperative System inpatient database was queried for patients ≥ 18 years who underwent wedge hepatectomy or lobectomy from 2000–2014. Patient data included demographics and comorbidities. Surgeon-specific data included annual hepatectomy volume, experience [early-career vs. late-career (< 20 vs. ≥ 20 years since medical school graduation, respectively)], and specialty training (general, transplant, or oncologic). Adjusting for both patient and surgeon factors, multiple logistic regression was performed to identify predictors of the primary endpoint - inpatient mortality.

RESULTS: 13,467 cases were analyzed. Overall inpatient mortality was 2.35% and was significantly lower among surgeons with > 30 cases per year (1.5% vs. 3.1%, $p < 0.001$). In unadjusted analysis, this difference appeared to persist in early-career (1.2 vs. 2.8%, $p < 0.001$) and late-career surgeons (1.8% vs. 3.2%, $p < 0.001$). However, once risk-adjusted, annual volume was associated with reduced mortality only among early-career surgeons (OR 0.826, $p = 0.01$) and general surgeons (OR 0.685, $p = 0.01$). No volume effect was seen among late-career or specialty-trained surgeons.

CONCLUSIONS: Cumulative experience and specialty training offset the effect of annual volume on inpatient mortality following hepatectomy, demonstrating that annual surgical volume alone is a poor surrogate for overall experience. Furthermore, this study highlights the need for longitudinal coaching of early-career surgeons by experienced faculty and the importance of fellowship training in hepatic surgery.

22**Understanding and Resetting Radiosensitivity in Rectal Cancer**

Katherine A. Kelley, Shushan Rana, Rebecca Ruhl, Christian Lanciault, John G. Hunter, Charles R. Thomas, Sudarshan Anand, Vassiliki L. Tsikitis
Oregon Health and Sciences University, Portland, OR

OBJECTIVE(S): Chemoradiotherapy (CRT) response is a predictor of survival in rectal cancer. The Cancer Genome Atlas (TCGA) demonstrates that microRNAs (miRs) and their downstream targets modulate carcinogenesis and progression. We hypothesized specific miRs would predict response to radiation and identify targets that may be exploited for adjuvant therapies.

METHODS: Thirty rectal cancer patients, partial responders (PR = 12), non-responders (NR = 12), and complete responders (CR = 6) to CRT, as defined by the Mark-Ryne Tumor Regression Score, were examined. miRs differentially expressed by Nanostring technology were validated with qPCR. We measured radiosensitivity and quantified downstream targets in HCT116 lines and patient samples.

RESULTS: miR-451a, 502–5p, 223–3p, and 1246 were the most upregulated miRs (> 1.5 fold change) by Nanostring profiling. qPCR revealed a significant decrease in expression of miR-451a in NRs. Transfecting a miR-451a mimic in HCT116 cell lines improved radiation response measured by surviving cell fraction, and decreased expression of all downstream targets. EMSY and CAB39, downstream targets of miR-451a involved in carcinogenesis (shown in TCGA) were increased in NRs (qPCR). (Figure 1) Both targets are associated with worse survival in colorectal cancer. (Figure 2).

Figure 1. miR-451a expression and decrease of its targets correlate with radiation responsive rectal tumors

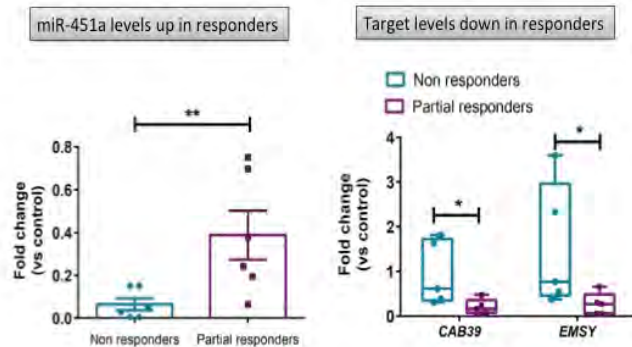
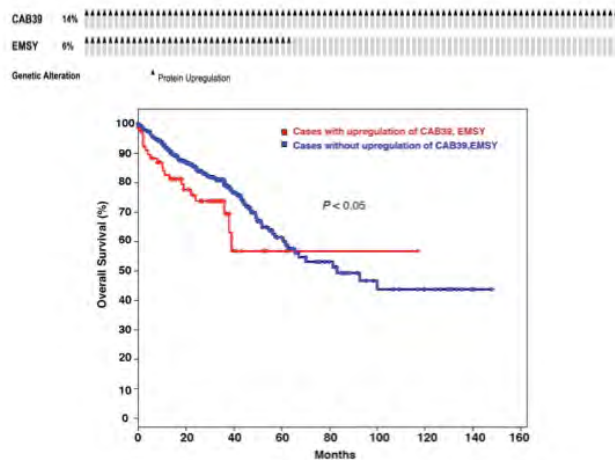


Figure 2. CAB39 and EMSY has prognostic value in colorectal cancer



CONCLUSIONS: Mir-451a is a promising predictor of CRT response and manipulation of its downstream targets may restore radiosensitivity in NRs.

23

Impact of the Hospital Readmission Reduction Program on Surgical Readmissions Among Medicare Beneficiaries

Andrew M. Ibrahim, Hari Nathan, Jyothi Thumma, Justin B. Dimick

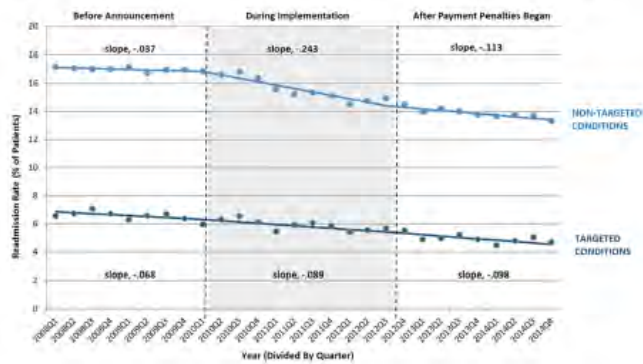
University of Michigan, Ann Arbor, MI

OBJECTIVE: The Hospital Readmission Reduction Program, established under the Affordable Care Act in March of 2010, placed financial penalties on hospitals with higher-than-expected rates of readmission beginning in 2012 for targeted medical conditions. Little is known about the impact of this program on this both future targeted and non-targeted surgical procedures.

METHODS: A retrospective review Medicare 5, 122, 240 beneficiaries who underwent future targeted procedures (total hip replacement, total knee replacements) or non-targeted procedures (colectomy, lung resection, abdominal aortic aneurysm repair, coronary artery bypass graft, aortic valve replacement, mitral valve repair) using an interrupted time-series model to assess the rates of readmission before the Hospital Readmission Reduction Program was announced (2008–2010), while the program was being implemented (2010–2012) and after penalties were initiated (2012–2014).

RESULTS: From 2008 to 2014 rates of readmission declined for both target conditions (6.8%–> 4.5%; $p > 0.001$) and non-target conditions (17.1%–> 13.4%; $p > 0.001$). The rate of reduction was most prominent after announcement of the program between 2010–2012 for both targeted and non-targeted conditions (Figure 1.) During the same time period, mean hospital length of stay decreased; non-targeted conditions (10.4–> 8.4 days; $p > 0.001$) and targeted conditions (3.6–> 2.8 days; $p > 0.001$).

Figure 1. Trends in Surgical Readmissions and the Hospital Readmission Reduction Program



CONCLUSIONS: Trends in readmissions after inpatient surgery are consistent with hospitals responding to financial incentives announced in the Hospital Readmission Reduction Program. There appears to be both an anticipatory effect (target procedures reducing readmission before payments implemented) as well as a spillover effect (non-targeted procedures also reducing readmissions.)

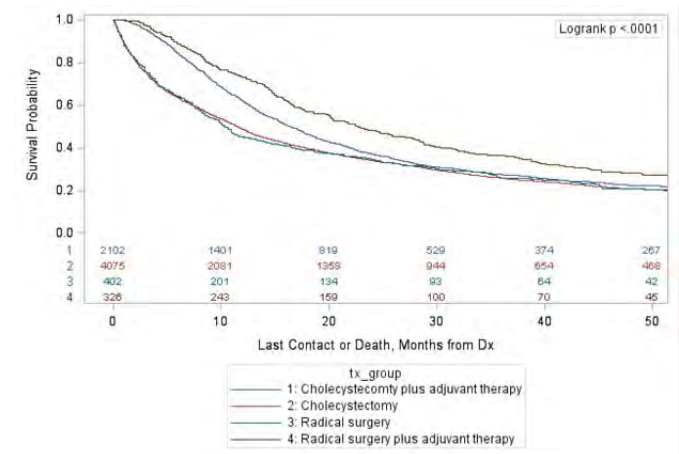
24

Surgical Management of Gallbladder Cancer: Simple Versus Extended Cholecystectomy and the Role of Adjuvant Therapy

Gyulnara G. Kasumova, Omidreza Tabatabaie,
Ayotunde B. Fadayomi, Sing Chau Ng, Jennifer F. Tseng
*Surgical Outcomes Analysis & Research, Beth Israel
Deaconess Medical Center, Boston, MA*

OBJECTIVE: While current guidelines recommend extended/radical cholecystectomy for T2/T3 gallbladder cancer, many are discovered incidentally at laparoscopic cholecystectomy and outcomes of re-resection versus adjuvant therapy remain to be investigated.

METHODS: National Cancer Database queried for patients with T2/T3 gallbladder adenocarcinoma 2004–2013 who underwent resection with or without adjuvant chemotherapy and/or radiation. Kaplan-Meier method used to compare overall survival.



RESULTS: 7,770 patients identified, of whom 6,941 (89.3%) underwent cholecystectomy and 829 (10.7%) extended/radical resection. Those undergoing radical surgery versus cholecystectomy were more likely to be: younger (≤ 70 ; 62.0% vs 42.4%, $p < 0.0001$), privately insured (32.9%

vs 24.5%, $p < 0.0001$), treated at academic facility (51.0% vs 26.6%, $p < 0.0001$), and have T3 disease (66.5% vs 41.3%, $p < 0.0001$). Radical surgery was more likely to result in negative resection margins (66.0% vs 58.4%, $p < 0.0001$). 2,740 (35.3%) received adjuvant therapy, more commonly following radical (44.6%) versus simple resection (34.1%, $p < 0.0001$). Median survival was longer for radical versus simple surgery (16.4 vs 13.2 months, log-rank $p = 0.0031$). However, median survival was significantly longer for radical surgery with adjuvant therapy (22.7 months) than cholecystectomy with adjuvant (16.4 months), which was significantly longer than either cholecystectomy (11.5 months) or radical surgery (10.3 months) alone (all log-rank $p \leq 0.0004$).

CONCLUSIONS: Adjuvant therapy significantly prolongs survival after resection of T2/T3 tumors. Furthermore, cholecystectomy with adjuvant therapy is superior to radical resection alone and may serve as potential alternative to re-resection.

25

Failure to Diagnose Hyperparathyroidism in 10,432 Patients with Hypercalcemia: Opportunities for System-Level Intervention to Increase Surgical Referrals and Cure

Courtney Balentine, Rongbing Xie, James J. Kirklin, Herbert Chen

University of Alabama at Birmingham, Birmingham, AL

OBJECTIVE(S): Failure to diagnose primary hyperparathyroidism and refer patients for surgical management leads to impaired quality of life and increased healthcare costs. We hypothesized that many patients with hyperparathyroidism remain undiagnosed and untreated due to lack of consideration of the diagnosis, inadequate evaluation of hypercalcemia, and under-referral for surgical treatment.

METHODS: We used administrative data to review 682,704 consecutive patients from a tertiary referral center between 2011 and 2015, and identified hypercalcemia (>10.5 mg/dl) in 10,432. We evaluated whether hypercalcemic patients underwent measurement of parathyroid hormone, had documentation of hypercalcemia/hyperparathyroidism in the medical record, or were referred for surgical evaluation.

RESULTS: The median age of our study population was 59 years, with 61% females, and 56% Caucasians. Only 3,200 (31%) of patients with hypercalcemia received appropriate biochemical workup with evaluation of parathyroid hormone level. Among patients with elevated serum calcium, 2,914 (28%) had a documented diagnosis of hypercalcemia and 880 (8%) had a diagnosis of hyperparathyroidism in the medical record. Additionally, only 592 (22%) out of 2,666 patients with classic hyperparathyroidism (both calcium and parathyroid hormone abnormal) were referred for surgical evaluation. Older patients were less likely to be referred to surgeons (OR 0.11, 95% CI 0.05–0.26 for ≥ 85 vs < 65 years) while race and insurance status did not affect referral.

CONCLUSIONS: A significant proportion of patients with hyperparathyroidism do not undergo appropriate evaluation and surgical referral. System-level interventions which prompt further evaluation of hypercalcemia and raise physician awareness about hyperparathyroidism could substantially improve patient outcomes and produce long-term cost savings.

FRIDAY AFTERNOON, APRIL 21st, CONTINUED

4:00 PM – 5:00 PM
Grand Ballroom Salons A - F

EXECUTIVE SESSION

ASA Fellows Only

Presentation of the Flance-Karl Award

FRIDAY EVENING, APRIL 21st

7:00 PM – 8:00 PM
Grand Ballroom Salons A – F Foyer

ANNUAL RECEPTION

Black tie is preferred, but dark suits are acceptable.

8:00 PM
Grand Ballroom Salons A - F

ANNUAL BANQUET

Black tie is preferred, but dark suits are acceptable.

SATURDAY MORNING, APRIL 22nd

8:00 AM – 11:00 AM
Grand Ballroom Salons A - F

SCIENTIFIC SESSION

Moderator: *New President-Elect*

26

Anatomical Resections Improve Disease Free Survival in Patients with KRAS-Mutated Colorectal Liver Metastases

Georgios Antonios Margonis¹, Stefan Buettner¹, Kazunari Sasaki¹, Nikolaos Andreatos¹, Jan N.M. IJzermans², Jeroen L.A. van Vugt², John L. Cameron¹, Jin He^{*1}, Christopher L. Wolfgang¹, Matthew Weiss^{*1}

¹Johns Hopkins Hospital, Baltimore, MD; ²Erasmus MC, Rotterdam, Netherlands

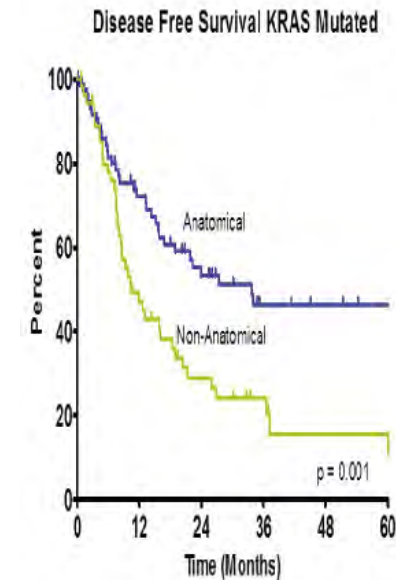
OBJECTIVE: KRAS-mutated colorectal liver metastases (CRLM) are known to be more aggressive than KRAS wild-type tumors. Although non-anatomical liver resections have been demonstrated as a viable approach for CRLM patients with similar oncologic outcomes to anatomical resections, this may not be the case for the subset of KRAS-mutated CRLM.

METHODS: 389 patients who underwent hepatic resection of CRLM with known KRAS mutational status were identified. Survival estimates were calculated using the Kaplan-Meier method, and multivariable analysis was conducted using Cox Proportional Hazards.

RESULTS: 165 patients (42.6%) underwent anatomical resections and 141 (36.2%) presented with KRAS-mutated CRLM. Median disease free survival (DFS) in the entire cohort was 21.3 months, while 1-, 3- and 5-year DFS was 67.3%, 34.9% and 31.5% respectively. Although there was no difference in DFS between anatomical and non-anatomical resections in patients with KRAS wild-type tumors ($p = 0.116$), a significant difference in favor of anatomical resection was observed in patients with a KRAS mutation (10.5 vs. 33.8 months; $p = 0.001$) (Figure). Five-year DFS was only 15.5% in the non-anatomically resected group, versus 46.4% in the anatomically resected

*By invitation

group. This observation persisted in multivariable analysis (HR:0.53; 95% CI: 0.32–0.88; $p = 0.015$), when corrected for disease-free interval, lymph-node status, tumor size and number, perioperative chemotherapy, and margin status.



CONCLUSION: Non-anatomical tissue-sparing hepatectomies are associated with worse DFS in patients with KRAS-mutated tumors. Due to the aggressive nature of KRAS-mutated CRLM, more extensive anatomical hepatectomies may be warranted.

27

Individualized Metabolic Surgery Score: Procedure Selection Based on Diabetes Severity

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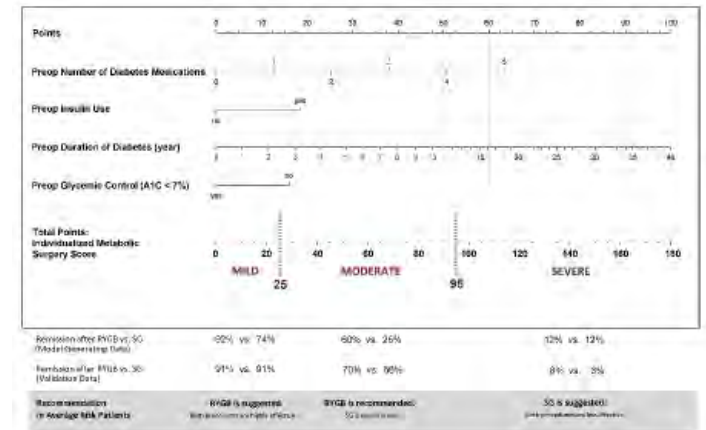
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OBJECTIVE(S): Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG) account for >95% of bariatric procedures in US in patients with type-2 diabetes (T2DM). While both procedures significantly improve T2DM in short-term, 30–50% of patients experience long-term relapse. To aid evidence-based selection of surgery for T2DM we have developed the first validated model.

METHODS: 659 patients with T2DM who underwent RYGB and SG at an academic center in US and had a minimum 5-year follow-up (2005–2011) were analyzed to generate the model. Validation dataset included 241 patients from Spain.

RESULTS: At median postoperative follow-up of 7 years (range: 5–12), diabetes remission (HbA1c < 6.5% off medications) was observed in 49% after RYGB and 28% after SG ($P < 0.001$). Four independent predictors of long-term remission were used to develop the Individualized Metabolic Surgery (IMS) Score (Nomogram). Patients were then categorized into three stages of T2DM severity and procedure recommendations were provided (Figure). Findings were externally validated.

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CONCLUSIONS: This is the largest reported cohort ($n = 900$) with long-term postoperative glycemic follow-up, which for the first time categorizes T2DM into three validated stages for evidence-based procedure selection. In mild T2DM (IMS Score ≤ 25), both procedures significantly improve diabetes. In severe T2DM (IMS Score > 95), when there is limited beta-cell reserve/function, both procedures have similarly low efficacy. There is an intermediate group, however, in which RYGB is significantly more effective than SG, likely related to its more pronounced neurohormonal effects.

28

Perception of Safety of Surgical Practice Among Operating Room Personnel from Survey Data Is Associated with All-Cause 30-Day Postoperative Death Rate in South Carolina

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OBJECTIVE(S): To evaluate whether the perception of safety of surgical practice among operating room (OR) personnel is associated with hospital-level 30-day postoperative death.

METHODS: As part of the Safe Surgery 2015: South Carolina initiative, a baseline survey measuring the perception of safety of surgical practice among OR personnel was completed. We evaluated the relationship between hospital-level mean item survey scores and rates of all-cause 30-day postoperative death using binomial regression. Models were controlled for multiple patient, hospital, and procedure covariates using supervised principal components regression.

RESULTS: The overall survey response rate was 38.1% (1793/4707) among 31 hospitals. For every one point increase in the hospital-level mean score for respect (adjusted relative risk (aRR) 0.78, 95% CI 0.65–0.93, P = 0.0059), clinical leadership (aRR 0.86, 95% CI 0.74–0.9932, P = 0.0401), and assertiveness (aRR 0.71, 95% CI 0.54–0.93, P = 0.01) among all survey respondents, there were associated decreases in the hospital-level 30-day postoperative death rate following inpatient surgery ranging from 14–29%. Higher hospital-level mean scores for the statement, “I would feel safe being treated here as a patient,” were associated with significantly lower hospital-level 30-day postoperative death rates (aRR 0.83, 95% CI 0.70–0.97, P = 0.02). Although most findings seen among all OR personnel were seen among nurses, they were often absent among surgeons.

CONCLUSIONS: Perception of OR safety of surgical practice was associated with hospital-level 30-day postoperative deaths. Reducing postoperative deaths requires that surgeons lead in ways that result in a culture where OR personnel feel respected and invited to speak up on behalf of patient safety.

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29

Tumor Biology and Response to Chemotherapy Impact Breast Cancer-Specific Survival in Node-Positive Breast Cancer Treated with Neoadjuvant Chemotherapy and Axillary Dissection: Long-Term Follow-Up from ACOSOG Z1071 (Alliance)

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OBJECTIVE(S): Breast cancer-specific survival (BCSS) and factors associated with BCSS among women with node-positive disease treated with neoadjuvant chemotherapy (NAC) on a large clinical trial were examined.

METHODS: ACOSOG Z1071 enrolled cT0-4N1-2 breast cancer patients treated with NAC from 2009–2011. All underwent axillary dissection. Factors impacting BCSS were analyzed.

RESULTS: Median follow-up of 701 eligible patients was 4.1 years (0.3–6.5). 90 (12.8%) died from breast cancer. Factors impacting BCSS were tumor subtype and chemotherapy response (p < 0.0001, table), which remained significant predictors of BCSS in multivariable analysis.

5-year BCSS was highest in HER2+ (95.7%), followed by hormone receptor (HR)+/HER2- (80.2%) and lowest in triple-negative (TNBC) (75.3%) (p < 0.0001). Patients with residual disease in breast and nodes had poorer BCSS (74.8%) than patients with pathologic complete response (pCR) in breast only (93.7%), nodes only (93.1%) and both breast and nodes (95.0%) (p < 0.0001).

In TNBC (n = 171) 5-year BCSS was higher in pCR patients than without pCR (89.8% versus 66.7%, p = 0.0036). In HER2-positive tumors (n = 212) chemotherapy response was not associated with BCSS (96.6% versus 95.1%, p = 0.65). In HR+/HER2- (n = 318) BCSS was 100% in pCR patients and 78% in no pCR (n = NA).

| Variable | Univariable | | Multivariable | |
|------------------------------|---------------------|---------|---------------------|---------|
| | HR (95% CI) | p-value | HR (95% CI) | p-value |
| Clinical T category | | | | |
| T0-T2 | 1.00 (ref) | 0.12 | 1.00 (ref) | 0.35 |
| T3-T4 | 1.40 (0.92 – 2.16) | | 1.26 (0.77 – 2.06) | |
| Tumor Biology | | | | |
| HR positive / HER2 negative | 1.00 (ref) | <0.0001 | 1.00 (ref) | |
| HER2 positive | 0.19 (0.08 – 0.44) | | 0.35 (0.14 – 0.83) | <0.0001 |
| Triple negative | 1.74 (1.14 – 2.68) | | 3.27 (2.04 – 5.26) | |
| Pathologic T category | | | | |
| T0/Tis | 1.00 (ref) | | 1.00 (ref) | |
| T1 | 3.09 (1.52 – 6.27) | <0.0001 | 2.40 (1.07 – 5.40) | 0.032 |
| T2 | 5.31 (2.62 – 10.76) | | 3.60 (1.52 – 8.53) | |
| T3/T4 | 5.93 (2.60 – 13.53) | | 2.77 (0.95 – 8.07) | |
| Pathologic N category | | | | |
| N0 | 1.00 (ref) | | 1.00 (ref) | |
| N1 | 2.57 (1.39 – 4.74) | <0.0001 | 1.56 (0.77 – 3.16) | 0.003 |
| N2 | 4.64 (2.49 – 8.65) | | 2.38 (1.11 – 5.12) | |
| N3 | 7.31 (3.53 – 15.14) | | 4.65 (1.91 – 11.34) | |
| Surgery Type | | | | |
| Breast Conservation | 1.00 (ref) | 0.23 | 1.00 (ref) | 0.75 |
| Mastectomy | 1.31 (0.85 – 2.02) | | 1.08 (0.68 – 1.72) | |
| Radiation | | | | |
| Yes | 1.00 (ref) | 0.84 | 1.00 (ref) | 0.25 |
| No | 1.06 (0.60 – 1.87) | | 1.41 (0.79 – 2.51) | |

CONCLUSIONS: In node-positive breast cancer treated with NAC and axillary dissection, BCSS is lowest in TNBC with residual disease. BCSS is >95% in HER2+ patients treated with anti-HER2 therapy independent of chemotherapy response.

SUPPORT: U10CA180821, U10CA180882.

ClinicalTrials.gov: NCT00881361

30

Molecular Adsorbent Recirculating System (MARS) Effectively Replaces Hepatic Function in Severe Acute Liver Failure (ALF)

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INTRODUCTION: Patients with severe ALF have extreme physiologic dysfunction and often die if transplantation is not immediately available. Patients may be supported with MARS (R, Gambro) until transplant or spontaneous recovery occurs. We present the largest US series of MARS therapy as temporary hepatic replacement for ALF.

METHODS: Data was analyzed from a Level One trauma center and large liver transplant center that has cared for over 1000 hepatic transplant recipients. MARS was used as bridge to transplant (BTT), definitive therapy for toxic ingestion (DT), and in severe liver trauma (SLT). Patient demographics, etiology of ALF, and laboratory values were recorded. End-points were patient survival +/- liver transplant and/or recovery of liver function.

RESULTS: 27 patients with severe ALF received MARS therapy. Mean MELD of the MARS group was 37 vs. 27 for total transplant program. 5 patients with SLT had a 60% survival with recovery of liver and renal function. 12 patients received MARS as a BTT. 8 received liver transplantation with a 1 yr survival of 88% (program overall survival 85% at 1 year). All 4 non-transplanted expired. 10 patients with ALF from toxic ingestion received MARS as DT with liver recovery and survival in 60%. Ammonia and INR significantly improved during MARS therapy (p < 0.05, 0.01). No one suffered cerebral herniation during MARS therapy.

CONCLUSION: MARS therapy successfully replaces hepatic function in ALF allowing time for spontaneous recovery or transplantation. Spontaneous recovery was remarkably common if support can be sustained with optimized critical care and MARS therapy.

31

Health-Related Quality of Life and Functional Outcomes in 5-year Survivors After Pancreaticoduodenectomy

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OBJECTIVE(S): Long-term quality of life (QOL) after pancreaticoduodenectomy (PD) is unknown. Our aim was to assess QOL and functionality in a large cohort of patients ≥ 5 -years after PD.

METHODS: The EORTC QLQ-C30 questionnaire was administered to patients who underwent PD between 1998 to 2011. Cohort's scores were compared to an age- and gender-adjusted normal population. Clinical relevance (CR) of differences were scored as small (5–10), moderate (10–20), or large (>20) based on validated interpretation of clinically important differences.

RESULTS: Of 307 ≥ 5 -year PD survivors, 243 (79.3%) responded, of whom 64.1% underwent PD for non-malignant lesions. Median follow-up was 9.1 yrs (range 5.2 yrs–15.4 yrs). New-onset diabetes developed in 6.9%; 50.4% take pancrelipase; 54.6% take antacid medication. Compared to the age- and gender-adjusted controls, 5-year PD survivors demonstrated higher global QOL (78.7 vs 69.7, CR small, $p < 0.001$), physical (86.7 vs 77.9, CR small, $p < 0.001$) and role-functioning scores (86.3 vs 74.1, CR medium, $p < 0.001$). On linear regression adjusting for socioeconomic variables, there were no differences in QOL or functional scores in the benign vs malignant subgroups. Age at operation was independently associated with physical-functioning ($-0.4/\text{year}$, $p = 0.008$). Taking pancrelipase (-6.8 , $p = 0.035$) or antacids (-6.3 , $p = 0.044$) was independently associated with lower social-functioning scores.

CONCLUSIONS: Patients who had a PD demonstrated better global QOL, physical- and role-functioning scores at 5-years when compared to age- and gender-adjusted controls. Approximately half of patients required pancrelipase or antacids, while only 7% developed new-onset diabetes. Concerns over impaired QOL or functional status should not weigh negatively in the consideration for PD.

32

Prediction of Recurrence Beyond Milan Criteria After Resection of Hepatocellular Carcinoma – An International Validation of a Clinical Risk Score

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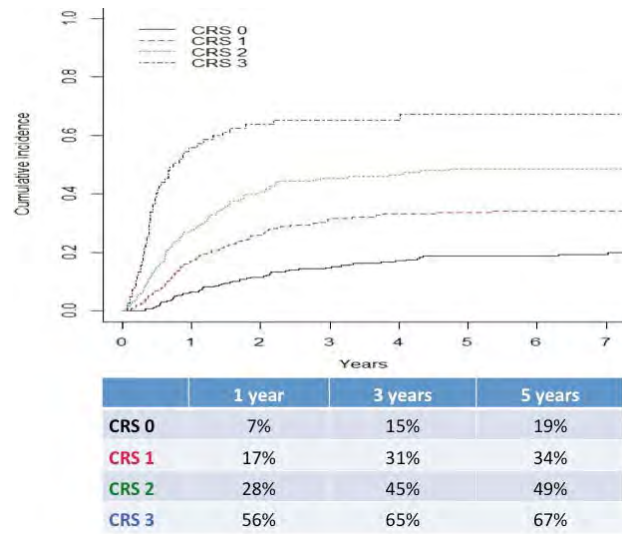
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OBJECTIVE: Salvage transplantation after hepatocellular carcinoma (HCC) resection is limited to patients who recur within Milan criteria (MC). Predicting recurrence patterns may guide treatment recommendations. This study aims to validate previously reported recurrence clinical risk score (CRS).

METHODS: Patients submitted to R0 resection of HCC from 5 international centers were categorized by MC status at presentation and recurrence. CRS was calculated by assigning 1 point each for initial disease beyond MC, multinodularity, and microvascular invasion. Recurrence incidence was estimated using competing risks methods.

RESULTS: From 1992–2015, 1023 patients were included, of whom 613 (60%) recurred at median follow-up of 50 months. Recurrence beyond MC ($n = 336$, 55%) was more common when initial disease was beyond MC ($n = 213$, 63%) vs. within MC ($n = 123$, 37%). CRS variables were all independent predictors of recurrence beyond MC (HR 1.5–2.1, all $p < 0.001$) and effectively stratified recurrence risk beyond MC, ranging from 19% (CRS = 0) to 67% (CRS = 3) at 5 years (Figure). Risk of recurrence beyond MC for all patients was 14% if recurrence-free for 2 years and 7% if recurrence-free for 5 years; this risk was 18% and 2%, respectively, with initial disease beyond MC and 11% and 6%, respectively, with initial disease within MC.

*By invitation



CONCLUSIONS: HCC recurrence risk beyond MC correlated with initial disease extent but was more accurately predicted by CRS, and while risk decreased over time, never reached zero.

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| 11 | Jonathan Abelson |
| 2 | David B. Adams |
| 14 | Vatche G. Agopian |
| 7 | Alberto Aiolfi |
| 15, 32 | Peter J. Allen |
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| 22 | Sudarshan Anand |
| 27 | Amin Andalib |
| 17 | Stephanie S. Anderson |
| 26 | Nikolaos Andreatos |
| 1 | Peter Angelos |
| 20 | Brett Arnoldo |
| 15 | Marc A. Attiyeh |
| 14 | Federico Aucejo |
| 13 | Elise Aucoin |
| 19 | Edward Auyan |
| 21 | Yanik J. Bababekov |
| 15, 32 | Vinod Balachandran |
| 25 | Courtney Balentine |
| 5 | Prabhakar Baliga |
| 2 | Chad G. Ball |

| Program # | Author |
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| 29 | Karla Ballman |
| 1 | Kristen A. Ban |
| 2 | Omar Barakat |
| 6 | Andrea Barrio |
| 30 | Rolf N. Barth |
| 30 | Stephen T. Bartlett |
| 3 | Jessica Beard |
| 10 | Ramy Behman |
| 2 | Stephen W. Behrman |
| 2 | Kevin E. Behrns |
| 11 | Richard H. Bell |
| 7 | Elizabeth Benjamin |
| 17 | Whitney J. Bergquist |
| 1 | Julia R. Berian |
| 28 | William R. Berry |
| 14 | Jennifer Berumen |
| 2 | Mark Bloomston |
| 19 | Jordan Bohnen |
| 29 | Judy C. Boughey |
| 5 | Charles Bratton |
| 15 | Murray F. Brennan |
| 27 | Stacy A. Brethauer |
| 2 | Kimberly M. Brown |
| 4 | Robert S. Brown |
| 26, 32 | Stefan Buettner |
| 27 | Bartolome Burguera |
| 14 | Ronald W. Busuttil |
| 29 | David Byrd |

| Program # | Author |
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| 10 | James Byrne |
| 26 | John L. Cameron |
| 18 | Joseph C. Carmichael |
| 14 | Carol A. Carney |
| 20 | Robert Cartotto |
| 16 | Juan P. Cata |
| 2 | Eugene P. Ceppa |
| 2 | Christy Chai |
| 32 | Chung Yip Chan |
| 21, 31 | David C. Chang |
| 14, 32 | William C. Chapman |
| 25 | Herbert Chen |
| 32 | Peng Chung Cheow |
| 8 | Yuen Chi |
| 8 | Murali Chintagumpala |
| 19 | Jeffrey Chipman |
| 19 | Jennifer Choi |
| 19 | Michael Choti |
| 32 | Joanne Chou |
| 32 | Pierce K.H. Chow |
| 16 | Yun Shin Chun |
| 32 | Alexander Y.F. Chung |
| 17 | Robert R. Cima |
| 2 | Natalie S.G. Coburn |
| 20 | Amalia Cochran |
| 6 | Hiram Cody |
| 1 | Mark E. Cohen |
| 27 | Ricard Corcelles |

| Program # | Author |
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| 19 | Debra DaRosa |
| 15, 32 | Ronald P. DeMatteo |
| 7 | Demetrios Demetriades |
| 13 | Karishma Desai |
| 2 | Mary E. Dillhoff |
| 19, 23 | Justin B. Dimick |
| 2 | Elijah Dixon |
| 8 | Jeff Dome |
| 20 | William Dominick |
| 9 | Jeffrey Drebin |
| 5 | Derek Dubay |
| 19 | Gary Dunnington |
| 28 | Lizabeth Edmondson |
| 8 | Peter F. Ehrlich |
| 2 | E. Christopher Ellison |
| 6 | Mahmoud El-Tamer |
| 4 | JeanC. Emond |
| 30 | Eno-obong Essien |
| 24 | Ayotunde B. Fadayomi |
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| 31 | Carlos Fernández-del Castillo |
| 31 | Cristina R. Ferrone |
| 14 | Thomas M. Fishbein |
| 2 | William E. Fisher |
| 14 | Sander S. Florman |
| 19 | Eugene Foley |
| 31 | Zhi Ven Fong |

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| 18 | John V. Gahagan |
| 12 | Barbara Gaines |
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| 17 | Halena M. Gazelka |
| 8 | James Geller |
| 19 | Brian George |
| 14 | Mark R. Ghobrial |
| 28 | Lorri R. Gibbons |
| 32 | Brian K.P. Goh |
| 15, 32 | Mithat Gonen |
| 16 | Vijaya Gottumukkala |
| 13 | Laura Graham |
| 8 | Eric Gratiias |
| 17 | Richard J. Gray |
| 20 | David G. Greenhalgh |
| 4 | James V. Guarerra |
| 17 | Elizabeth B. Habermann |
| 4, 14 | Karim J. Halazun |
| 1 | Bruce L. Hall |
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| 17 | Kristine T. Hanson |
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| 21 | Daniel A. Hashimoto |
| 20 | Dhaval Havsar |
| 13 | Mary T. Hawn |
| 14 | Brandy Haydel |

| Program # | Author |
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| 26 | Jin He |
| 14 | Alan W. Hemming |
| 13 | Tina Hernandez-Boussard |
| 8 | Fred Hoffer |
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| 16 | Alexander Holmes |
| 20 | James Holmes |
| 14 | Johnny C. Hong |
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| 2 | Cary Hsu |
| 2 | Steve J. Hughes |
| 29 | Kelly K. Hunt |
| 22 | John G. Hunter |
| 23 | Andrew M. Ibrahim |
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| 27 | Amanda Jimenez |
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| 31 | Colin D. Johnson |
| 14 | Christopher M. Jones |
| 29 | Thomas Julian |
| 8 | John Kalapurakal |

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| 24 | Gyulnara G. Kasumova |
| 4 | Tomoaki Kato |
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| 22 | Katherine A. Kelley |
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| 15, 32 | T. Peter Kingham |
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| 14 | David D. Lee |
| 16 | Jeffrey E. Lee |
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| 28 | Zhonghe Li |
| 19, 21, 31 | Keith D. Lillemoe |
| 28 | Stuart R. Lipsitz |
| 1 | Jason B. Liu |
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| 18 | Steven Mills |
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| 2 | Katherine A. Morgan |
| 13 | Melanie Morris |
| 6 | Monica Morrow |
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| 8 | Elizabeth Mullen |
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| 32 | London L.P.J. Ooi |
| 20 | Tina L. Palmieri |
| 6 | Sujata Patil |

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| 8 | Arnold Paulino |
| 8 | Elizabeth Pearlman |
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| 18 | Alessio Pigazzi |
| 6 | Melissa Pilewskie |
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| 2 | Taylor S. Riall |
| 13 | Joshua Richman |
| 8 | Michael Ritchey |
| 31 | Margaret Ruddy |
| 22 | Rebecca Ruhl |
| 14 | Richard M. Ruiz |
| 4 | Benjamin Samstein |
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| 2 | Aaron R. Sasson |
| 30 | Thomas M. Scalea |
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| 2 | Carl R. Schmidt |
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| 19 | Nathanial Soper |
| 11 | Julie Sosa |
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| 24 | Omidreza Tabatabaie |

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| 14 | C. Burcin Taner |
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| 32 | Jin Yao Teo |
| 19 | Kyla Terhune |
| 14 | Amit D. Tevar |
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| 22 | Charles R. Thomas |
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| 26 | Jeroen L.A. van Vugt |
| 6 | Kimberly Van Zee |
| 32 | Franck Vandenbroucke-Menu |
| 16 | Jean-Nicolas Vauthey |

| Program # | Author |
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| 2 | Vic Velanovich |
| 14 | Elizabeth C. Verna |
| 27 | Josep Vidal |
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| 2 | Charles M. Vollmer |
| 13 | Tyler Wahl |
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| 26 | Matthew Weiss |
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| 19 | Paul Wise |
| 26 | Christopher L. Wolfgang |
| 25 | Rongbing Xie |
| 11 | Heather Yeo |
| 32 | Jian Zheng |
| 14 | Michael A. Zimmerman |
| 19 | Joseph Zwischenberger |
| 2 | Nicholas J. Zyromski |

SCHEDULE-AT-A-GLANCE

THURSDAY, APRIL 20th

8:15 AM Opening Session Grand Ballroom Salons A – F
 President's Opening Remarks
 Secretary's Welcome and Introduction of New Fellows
 Elected in 2016
 President's Introduction of Honorary Fellows
 Presentation of the Medallion for the Advancement of Surgical Care
 Past President Eulogy
 Report of the Committee on Arrangements

9:10 AM Scientific Session I Grand Ballroom Salons A – F
 Moderator: Keith D. Lillemoe, M.D.

10:50 AM Presidential Address Grand Ballroom Salons A – F
“Surgical Mentorship: A Great Tradition, but Can We Do Better for the Next Generation?”
 Introduction: Theodore N. Pappas, M.D.
 Address: Keith D. Lillemoe, M.D.

1:30 PM Scientific Session II Grand Ballroom Salons A – F
 Moderator: Ronald V. Maier, M.D.

FRIDAY, APRIL 21st

6:30 AM ASA Women in Surgery Breakfast Franklin 13

8:00 AM Scientific Session III Grand Ballroom Salons A – F
 Moderator: Keith D. Lillemoe, M.D.

10:30 AM Forum Discussion: Grand Ballroom Salons A – F
“A Lifetime of Surgical Education: Can We Do Better?”
 Moderator: Keith D. Lillemoe, M.D.

1:30 PM Scientific Session IV Grand Ballroom Salons A – F
 Moderator: Theodore N. Pappas, M.D.

4:00 PM Executive Session (Fellows Only) Grand Ballroom Salons A – F
 Presentation of the Flance-Karl Award

7:00 PM Annual Reception Grand Ballroom Salons A – F Foyer
(Black tie preferred, but dark suits are acceptable.)

8:00 PM Annual Banquet Grand Ballroom Salons A – F
(Black tie preferred, but dark suits are acceptable.)

SATURDAY, APRIL 22nd

8:00 AM Scientific Session V Grand Ballroom Salons A – F
 Moderator: New President-Elect

11:00 AM Adjourn